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PHILIPPINE NEUROPTEROID INSECTS

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SIX PLATES

The following descriptions and synopses are largely the result of studying the specimens collected in southern Mindanao by Mr. Charles F. Clagg. Much of Clagg's collecting was done on Mount Apo, which has rarely been visited by entomologists. It is not surprising, therefore, that a number of species are new. Some of the new species are among those sent me by the late Charles Fuller Baker shortly before he died.

Nearly all of the known Philippine neuropteroid insects come from either Luzon or Mindanao. Until more is known of those from other islands there is little value to generalizations on distribution. As far as known the species are very different from those of Formosa, but related to those of the Greater Sunda Islands.

PSOCIDÆ

PSOCUS DOLOROSUS sp. nov. Plate 2, fig. 12.

Head dark brown, clothed with short white hair, eyes of female about two and one-half diameters apart; antennæ extremely long, reaching much beyond wings, almost black, clothed with very long hairs; thorax almost wholly black, sutures between lobes pale; abdomen and legs black.

Forewings mostly hyaline on basal part, on apical part mostly dark brown, stigma wholly black and extending behind on basal part, most of areola postica hyaline, only posterior side dark, discoidal cell pale on basal half, veins all dark, the vein closing discoidal cell also dark, forking of radial sector sometimes very

faintly pale, black dot at nodus, and a little before this a brown band obliquely up to medius; hind wings faintly fumose, veins brown.

Stigma rather slender, rounded behind; areola postica narrow above; forks of radial sector fully twice as long as the pedicel, base of radial sector obliquely curved.

Length, to tip of wing, 5.5 mm; antennæ, 8.5.

MINDANAO, Davao Province, Tia Ridge, Mainit River, and Todaya Plateau, all on Mount Apo, altitude 5,000 to 6,500 feet, September 2 to 24 (*Clagg*). Type, Museum of Comparative Zoölogy No. 21743.

PSOCUS ALTICOLUS sp. nov. Plate 1, fig. 8.

Head brown, clothed with short white hair, in female a pale area each side on vertex, eyes of female about three diameters apart; antennæ pale brown, clothed with moderately long hair in female, and very long hair in male; thorax brown, with pale lines between and on sides of the lobes; abdomen brown, somewhat spotted with pale; legs pale.

Forewings hyaline, apical half wholly evenly fumose, leaving the basal third of stigma white, some faint clouds above nodus tend to form a band, and another faint cloud nearer to base, veins largely dark, end of discoidal cell hyaline-white, forking of radial sector also white, also basal fourth of stigmal margin, and on hind margin a white streak for some distance before the nodus. Hind wings scarcely smoky, veins brownish.

Forewing with stigma rather large and broad, almost (but not quite) angulate behind; forks of radial sector almost parallel and longer than pedicel; discoidal cell about one-half as wide at tip as at base; basal part of radial sector curved; areola postica very broad above.

Length, 5 mm.

MINDANAO, Davao Province, Galog River, Tia Ridge, Todaya Plateau, Baroring River, Mainit River, Sibulan River, and Batraeyon, all on Mount Apo, altitude 5,000 to 8,000 feet, August 31 to November 7 (*Clagg*). Type, M. C. Z. No. 21742.

The parallel radial forks are like those of *P. cinereus* Endl., but that species is neither pale on basal part of wings nor as dark on the apical part. Enderlein later put *P. cinereus* in one of his numerous genera split from *Psocus*.

PSOCUS INCOMPTUS sp. nov. Plate 1, fig. 9.

Head brown, sometimes paler on vertex, clothed with short white hair, eyes of male only about one-half diameter apart, of female fully three diameters apart; antennæ dark, in male as

long as wings, in female shorter, densely hairy, in male with very long hair; thorax, abdomen, and legs dark brown. Forewings uniform gray all over, stigma no darker than the rest, veins mostly brown, that closing discoidal cell, the forking of radial sector, medius before end of discoidal cell, and end of cubitus white. Hind wings scarcely darkened, veins brown.

Stigma elongate, rounded behind, the widest part but little beyond middle; forks of radial sector slightly divergent, very much longer than pedicel; discoidal cell not twice as wide at base as at tip; areola postica very long above on medius, usually as long or longer than end of discoidal cell.

Length, 4.5 mm; antennæ, male, 4.5.

MINDANAO, Davao Province, Lawa, May 5; La Lun Mountains, July 5 (*Clagg*). Type, M. C. Z. No. 21741.

Differs from allied forms in the faint and even color of the forewings and in the not darker stigma.

STENOPSOCUS DISSIMILIS sp. nov.

Head yellowish brown, nasus darker, antennæ brown, as long as wings, finely short-haired, thorax brown on the lobes, paler between, clothed with moderately short, white hair like that of head; abdomen brown, legs pale. Forewings hyaline, very faintly fumose, hardly noticeable; veins brown, stigma very pale yellowish; hind wings hyaline, veins brownish.

Forewings with stigma but little longer than greatest length of discoidal cell (shorter than in *S. tonkingensis*), somewhat beyond the middle slightly angulate (at the crossvein), before this the side concave, beyond, convex; forks of radial sector about equal to pedicel, plainly divergent; union of radial sector and medius not quite as long as the basal part of radial sector; discoidal cell about one and one-half times as long as apex; areola postica large, triangular, nearly as high as long, the crossvein to medius only one-half the height of cell (in *S. tonkingensis* much longer). Wing broad and evenly rounded at tip, much as in *S. apertus*; the space between radial sector and medius a little wider before than at the crossvein to areola postica (not as wide, however, as in *S. infirmus*).

Length, 4.5 mm.

MINDANAO, Davao Province, Mount Apo, Tia Ridge, altitude 6,500 feet, September (*Clagg*). Type, M. C. Z. No. 21945.

OPHIODOPELMA MULTIPUNCTATA Hagen. Plate 1, fig. 1.

One from Galog River, Mount Apo, Mindanao, altitude 6,000 feet, November 5, agrees with Hagen's type from Ceylon; I give a figure of the forewing.

Key to the Philippine species of *Cæcilius*.

1. Forewings with a dark longitudinal streak from near base to tip, often with side branches 2.
No such marking 6.
2. With a projection from the dark streak across the yellow stigma; all space behind outer median vein dark to the hind margin; space between forks of the radial sector dark..... *plagosus*.
3. No projection from dark streak towards stigma, nor up along upper branch of radial sector, and almost all of space back of the medius pale *muggenburgii*.
A projection towards stigma, or up along the upper branch of radial sector 4.
4. No projection towards stigma, but upper branch of radial sector bordered, some clear space between radial sector and medius at apex. *reductus*.
A projection from the dark streak towards stigma..... 5.
5. Outer space behind medius practically entirely dark..... *deceptus*.
Outer space behind medius largely pale, the branches narrowly bordered with dark *marcidus*.
6. Entire wing dark brown to blackish, no pale spaces whatever, at least in apical half; head and thorax black..... *claggi*.
Not wholly dark brown to blackish..... 7.
7. Forewing with a brown band just before middle, and one from stigma to hind margin where it connects with the brown bordering the outer margin *aridus*.
No such marks 8.
8. Large species, antennæ plainly with black band at tips of joints, wings slightly fumose *cincticornis*.
Antennæ not plainly banded 9.
9. Veins pale, plainly dotted with dark, small spots on wing, some tending to form a band behind the stigma; small species..... *guttulatus*.
Veins not plainly dotted with dark..... 10.
10. Antennæ, except base, jet black; no spots on wing..... *conspicuus*.
Antennæ wholly pale 11.
11. Wings wholly unmarked, no dot even at nodus or on stigma..... 12.
Wings more or less marked with dark..... 13.
12. Areola postica three times as long as broad... *Pseudocæcilius innotatus*.
Areola postica hardly more than twice as long as broad..... *castillus*.
13. A series of dark marks, one in each marginal cell, stigma broad, mostly dark *Ophiidopelma multipunctatus*.
No such series of marks..... 14.
14. Forks of radial sector nearly twice as long as pedicel, areola postica fully twice as long as broad..... *inæqualis*.
Forks of radial sector not or scarcely as long as the pedicel..... 15.
15. Several veins in apical half of wing with small bordering spots, basal part of radial sector not dark, no dark spot over it to medius. *nitoris*.
No spots on veins in apical part of wing, except in stigma, basal part of radial sector dark or a dark spot over it to the medius, antennæ of male very long-pilose..... *otiosus*.

CÆCILIUS MARCIDUS sp. nov.

Head in male dark brown, in female paler, eyes in male very large, separated by scarcely more than one-half their diameter, in female by about twice their diameter; antennæ pale, head and antennæ densely clothed with short hair; thorax brown; abdomen paler; legs pale, unmarked.

Forewings with a dark brown streak from base to tip, leaving a wide clear space in front and behind, in apical part but little wider than space between radial sector and medius, which are nearly parallel for most of their length; stigma pale yellowish, a dark spot from the dark streak reaches up to corner of stigma but does not go across, basal part of space between forks of radial sector dark; branches of medius to hind margin bordered with brown, and hind margin of areola postica likewise bordered.

Stigma slightly angulate behind, outer part nearly as long as basal part; areola postica subtriangular, a little longer than high and of moderate size; forks of radial sector not nearly as long as pedicel, but somewhat more than one-half as long; union of radial sector and medius about one-half as long as base of radial sector. Hind wings fumose, except pale outer costal area.

Length, 2.5 mm.

MINDANAO, Davao Province, Calian, June 13 and 17 (*Clagg*).
LUZON, Laguna Province, Mount Maquiling (*Baker*). Type, M. C. Z. No. 21749.

In one wing of one specimen the areola postica is connected by a crossvein to the medius.

CÆCILIUS CONSPICUUS sp. nov. Plate 2, fig. 18.

Head pale yellowish, unmarked, hairs extremely minute, eyes of male very large and projecting in front as well as laterally, not quite one-half their diameter apart; basal three joints of antennæ yellowish, beyond antennæ deep black and rather heavy in the male, hairs dense, but short. Thorax with three large shining brown spots above, pleura pale as also legs, unmarked; abdomen pale, but dark above at base and at tip.

Wings hyaline, unmarked, veins yellowish, stigma also pale yellowish. Forewings very long and slender, stigma also very long, but low and broadly rounded behind; areola postica rather small and low, fully twice as long as high; forks of radial sector almost as long as pedicel, union of radial sector and medius about as long as base of radial sector which is curved.

Hind wings with upper branch of radial sector plainly oblique.

Length, 4 mm.

LUZON, Mountain Province, Baguio (*Baker*). Type, M. C. Z. No. 21746.

CÆCILIUS CLAGGI sp. nov. Plate 1, fig. 4.

Head brown to black, with many moderately short hairs, some each side on vertex longer, in female eyes small and nearly three diameters apart, in male eyes very large and only about one diameter apart; antennæ dark, in both sexes with long hairs but those of male about one-half longer than those of female; thorax, abdomen, and legs blackish. Both wings wholly blackish, as also the veins, a slightly paler area in forewing just beyond the end of anal veins.

Forewings rather broad; stigma very long, moderately broad, but rounded behind; areola postica about twice as long as high, evenly rounded above; forks of radial sector not quite as long as pedicel; union of radial sector and medius very short; hairs on margin dense, but not very long.

Length, 3.5 mm.

MINDANAO, Davao Province, Mount Apo, Kidapayan Trail, altitude 7,000 to 8,000 feet, September 20; La Lun Mountains, July 5; Calian, January 1; Lawa, May 5 (*Clagg*). Type, M. C. Z. No. 21747.

CÆCILIUS NITORIS sp. nov. Plate 1, fig. 2.

Head white, unmarked, clothed with rather long hairs, in male the eyes not a diameter apart; antennæ pale, with rather long hair; thorax and abdomen pale brown, legs whitish, unmarked.

Forewings hyaline, with partly pale and partly dark veins; at forking of cubitus from medius several brown spots tending to form a band; small brown spots in base of apical forks, along outer margin of areola postica, at tip of stigma, and in forking of radial sector and medius; one brown spot along medius, and one along radial sector near middle of wing. Beyond the stigma the margin quite broad, and tapering around the tip; stigma elongate, rounded behind; areola postica quite high and short (in one specimen not quite as high as figured); forks of radial sector hardly one-half as long as pedicel; margin of wing with quite long hairs.

Hind wings hyaline, veins pale, upper branch of radial sector transverse.

Length, 2.2 mm.

LUZON, Laguna Province, Mount Maquiling (*Baker*). Type, M. C. Z. No. 21751.

CÆCILIUS OTIOSUS sp. nov. Plate 1, fig. 7.

Head brown, clothed with moderately long hair; eyes of male very large, much less than one diameter apart; antennæ pale, with extremely long hairs; thorax with three large brown spots on the lobes; abdomen brown, legs pale, scarcely marked with dark.

Forewings hyaline, veins pale; outer part of stigma dark and a slight extension behind it, a large dark spot tending to form a band over forking of cubitus and medius, and a dark spot at end of anal veins. Stigma long, rounded behind; areola postica rather high, longer than high, triangular; margin of wing very broad beyond stigma, tapering around tip; forks of radial sector fully equal to pedicel.

Hind wings hyaline, veins brownish.

Length, 2.5 to 3 mm.

MINDANAO, Davao Province, Mount Apo, Mainit River, altitude 6,000 feet, September 10 (*Clagg*). LUZON, Laguna Province, Mount Maquiling (*Baker*). Type, M. C. Z. No. 21750.

Sometimes the basal spot is not so distinct, but the veins here are heavily black; in one specimen (perhaps different) the head is paler and the areola postica is lower.

CÆCILIUS PLAGOSUS sp. nov.

Head black (no pale area on vertex) clothed with short pale hair, eyes of female very small, antennæ pale, with very short hair; thorax dark brown, legs pale. Forewings with a dark streak through from base to tip, and occupying most of wing, in outer part reaching to hind margin, a triangular pale area over basal part of areola postica reaching up to medius, before the end of anals a small pale spot on margin, and before this a large triangular whitish spot reaching two-thirds across wing. Stigma yellow, behind and beyond it a clear area; a dark process from the main dark streak up and across stigma (as in *dolobratus*); stigma angulate behind, the areola postica large, a little longer than high and evenly rounded; forks of radial sector not nearly as long as stalk; union of radial sector and medius about as long as base of radial sector.

Hind wings fumose except outer costal part, but branch of radial sector to margin bordered with brown.

Length, 3 mm.

LUZON, Laguna Province, Mount Maquiling (*Baker*). Type, M. C. Z. No. 21748.

Cæcilius dolobratus has the cell between forks of radial sector pale, areola postica hardly one-half as large, and antennæ dark.

PSEUDOCÆCILUS INNOTATUS sp. nov. Plate 2, fig. 19.

Head and thorax yellowish brown, head with some fine short hairs and scattered much longer ones, particularly by the side of eyes and on vertex; eyes in male large, hardly one diameter apart, vertex roundly concave (not angularly); antennæ pale yellowish, in male with very long scattered hairs; thorax with dense short hairs, and a few long erect ones; abdomen pale, legs also, unmarked. Wings very faintly yellowish, unmarked, veins and stigma pale. Stigma very long and slender, rather blunt at tip; areola postica fully three times as long as broad, evenly rounded above; forks of radial sector not as long as pedicel; union of radial sector and medius much longer than base of radial sector; in anal area a long fusiform strip of minute scales or spicules; outer marginal hairs crossed as usual; in hind wings the upper branch of radial sector is strongly oblique.

Length, 3 mm.

MINDANAO, Davao Province, Mount Apo, Mainit River, altitude 6,000 feet, September 9 (*Clagg*). Type, M. C. Z. No. 21744.

Differs from *P. testaceus* Endl. in shape of stigma, shorter hairs on veins, shorter base of radial sector, and other characters.

EPIPSOCUS PROMINENS sp. nov. Plate 1, fig. 10; Plate 2, fig. 17.

Face shining black, sides of head back of antennæ pale, vertex pale, short hairs on face, longer ones on vertex; antennæ pale; eyes of male very large, not quite their short diameter apart, projecting greatly in front as well as above and laterally; the face exceptionally elongate, about twice as long as usual; thorax and abdomen brown; legs pale, tips of tibiæ darker, hind legs very long.

Wings hyaline; forewing with the stigma almost wholly brown, a small pale space at base, and a smaller one near tip; extreme tip of wing dark, veins brown, long-haired. Stigma long and slender, broadly rounded behind; forks of radial sector about as long as pedicel; areola postica elongate, over twice as long as high, highest near base, outer part sloping; crossvein from radial sector to medius longer than base of radial sector, but not longer than base of medius.

Forewing, length, 5 mm.

MINDANAO, Davao Province, Mount Apo, Mainit River, altitude 6,000 feet, September 22 (*Clagg*). Type, M. C. Z. No. 21753.

This species must be related to *E. longiceps* Endl., from Java, hardly more than one-half the size, with a face said to have a V-mark and legs more marked.

MICROPSOCUS BASALIS sp. nov. Plate 1, fig. 6.

Head brown to almost black, with scattered, moderately short, pale hairs; eyes of female about three diameters apart, of male fully twice as large and not two diameters apart; ocelli large, close together; antennæ pale yellowish brown, with moderately short hairs. Thorax brown, haired like head; abdomen brown; legs pale, unmarked.

Forewings largely brown, but with many clear spots, similar in arrangement to that of *M. erosus* Endl., but the brown more definite and not broken up by numerous small spots; base of stigma with a large clear spot (dark in *M. erosus*). Clear spots on margin of each apical cell around to just before cubitus, the one beyond stigma double; between radial sector and medius three other spots, between radius and medius (towards base) two large pale spots, one curved; in most specimens the outer dark marks appear to form a curved band. Wing somewhat broader than in *M. erosus*, but venation very similar, the intermediate median cell often much wider than figured for *M. erosus*, but variable. Hairs along margin very evenly spaced.

Length, 1.8 mm.

MINDANAO, Davao Province, Calian, June 12 (*Clagg*). Type, M. C. Z. No. 21752.

SEOPSIS TRICOLOR sp. nov. Plate 1, fig. 3.

Head brown, above almost purplish or reddish brown, clothed with very minute appressed white hair; ocelli in a moderately low triangle, the posteriors rather large, about two diameters apart and more than twice as far from eyes; antennæ very fine, with scattered long hairs; thorax also brownish, but not so dark as head; abdomen pale brown; legs pale on femora, tibiæ dark, and hind tibiæ with rather small erect bristles.

Forewings dark, largely with dark scales, a broad oblique stripe of yellowish to golden scales, starting from near hind margin at end of basal third, and extending out to near tip of wing where there is a circular patch of jet black hair; the lower border of the yellow stripe edged with snow white, white scales in front and behind the apical black spot; just before the black spot two divergent lines of white scales across the black from the yellow stripe to costa, and about at middle a patch or two lines of white from yellow stripe to margin. Hind wings faintly

infusate, rather darker near tip. Fringes short and mostly dark, but two white patches near tip of forewing.

Length, 3.5 mm.

MINDANAO, Davao Province, Baroring River, 7,000 feet; Galog and Mainit Rivers, 6,000 feet; Tia Ridge, 6,500 feet; all on Mount Apo, September to November; Lawa, May 5 (*Clagg*). Type, M. C. Z. No. 21755.

SEOPSIS LUZONICA sp. nov. Plate 1, fig. 5.

Head dull yellowish, or brown, with a pale band across, interrupted by ocelli, and with two dark marks each side on vertex, clothed with minute appressed white hair; ocelli in a moderately low triangle, posteriors about twice as far from eyes as from each other; antennæ pale, very short and fine, with scattered long hairs; thorax brown, with fine white hairs; abdomen brown above, pale beneath; legs pale, tibiæ with some fine bristles.

Forewings brown, clothed with tawny to golden scales, and with many snow white ones intermingled, the white mostly on posterior and outer part without definite pattern, a large spot of tawny scales at tip of wing. Hind wings hyaline, apical third infusate, veins brown. Fringes of both pairs rather short, mostly of dark hair.

Length, 2.2 mm.

LUZON, Laguna Province, Mount Maquiling (*Baker*). Type, M. C. Z. No. 21754.

PERLIDÆ

Key to the Philippine species of *Neoperla*.

1. Wings black *atripennis*.
Wings yellowish or yellowish brown..... 2.
2. Forewings with a clear space near middle; ocelli fully one diameter apart, scars much nearer to eyes than to ocelli..... *hermosa*.
Forewings without a clearer space near middle..... 3.
3. Cubital fork arising near first cubital crossvein in a broad angle, sometimes beyond the crossvein; smaller species..... 4.
Cubital fork arising much before the first cubital crossvein in a very acute angle; usually larger species..... 7.
4. Ocelli but little, if any, more than one diameter apart and twice as far from the lateral scars..... 5.
Ocelli farther apart, and not twice as far from the lateral scars..... 6.
5. Wings and veins wholly pale yellowish..... *clarissa*.
Wings and veins brownish..... *consimilis*.
6. Wings hyaline, veins yellow *bakeri*.
Wings fumose, veins brownish..... *claggi*.
7. Lateral carina of face usually not extending back of inner angle of eye; radial crossvein nearly straight across..... 8.

- Lateral carina of face usually extending back of inner angle of eye; radial crossvein very plainly oblique; rarely crossveins among radial branches 11.
8. Antennæ dark; tibia slightly darker than femur; ventral plate somewhat angulate behind 9.
- Antennæ pale; tibia not darker than femur 10.
9. Ocelli large, larger than lateral scars *viscayana*.
Ocelli not larger than lateral scars; dark cloud on clypeus; ocelli rather farther apart than usual; often one or more crossveins among the branches of radial sector *recta*.
10. Pronotum broadly margined with pale; lateral carina of face extended back *pallescens*.
Pronotum wholly brownish *pallicornis*.
11. Antennæ darkened beyond first joint; crossveins not darkened.... *obliqua*.
Antennæ not darkened beyond basal joint 12.
12. Eyes short, round; head not darkened; radial crossvein only slightly oblique; lateral border of pronotum broadly pale yellow.... *pallescens*.
Eyes elongate, almost pointed behind; head darkened; lateral border of pronotum not broadly pale yellow *apoana*.

Neoperla incerta Klap., 1921, one female from Mindanao; the author says ocelli as close to eyes as to each other. This description fits none I have seen, but in *N. recta* the ocelli approach this condition; the ventral plate is shown angulate behind, so *N. incerta* is doubtless a synonym of *N. recta*.

Folga luzonica Navas, 1918, is also the same as *N. recta*.

Neoperla pastellsii Navas, 1925, is probably *N. obliqua*, judging from Navas's figure of the ocelli and his description.

NEOPERLA PALLESCENS sp. nov.

Face pale brownish; basal joint of antennæ also brown, beyond pale; palpi pale; no distinct spot around ocelli; pronotum broadly pale yellow on the sides, more than one-half of middle brownish; thorax and abdomen yellowish; legs and setæ also pale yellow; wings pale yellowish, veins yellow. Eyes short and nearly circular; ocelli moderately large, about one and one-half diameters apart, fully twice as far from the eyes; lateral scars about as large as ocelli, and scarcely nearer to eyes than to ocelli; lateral face ridges continued back of eyes. Pronotum only a little broader in front than long, anterior angles not prominent, sides rounded and tapering a little behind; ventral plate of female evenly and slightly convex.

Forewings with cubital fork arising at an acute angle long before first cubital crossvein, but there is an oblique medial crossvein (hardly complete) just before it; all costal crossveins thickened, two beyond end of subcosta, radial crossvein scarcely oblique, radial sector with two branches beyond crossvein; sec-

ond anal vein parallel to first, third anal not sinuous; seven or eight medial crossveins, five or six cubital crossveins.

Hind wings with about six cubital crossveins, radial sector with two branches beyond crossvein.

Expanse, 30 mm.

MINDANAO, Kolambugan (*Baker*). Type, M. C. Z. No. 22101.

NEOPERLA APOANA sp. nov.

Head more or less embrowned, without definite marks; palpi brownish; first joint of antennæ usually brown, beyond paler; legs pale, tibia no darker than femur, latter sometimes darkened near tip; pronotum brownish, often paler on sides; sternum and abdomen pale, as also the setæ, meso- and metanotum usually showing a pale median stripe. Wings scarcely infusate, veins pale yellowish brown, some crossveins often faintly margined with brown, costal veins paler; in hind wings all veins pale.

On head the lateral carina extending backward beyond angle of eye; ocelli of moderate size, hardly two diameters apart, sometimes a little more, twice as far from eyes; lateral scars elliptical, slightly oblique, usually as near or nearer to eye than to ocellus; pronotum usually as wide as head, anterior corners often angulate and prominent, behind narrowed, but not as much as in *N. recta*, anterior margin moderately convex, rugose as usual; ventral plate straight across; last dorsal segment evenly convex.

Forewings with cubital fork arising at an acute angle long before first crossvein; two to five crossveins beyond end of subcosta, numerous costals, usually all of them thickened, about seven to nine median crossveins and five to six cubitals, radial sector 3- or 4-branched, radial crossvein plainly oblique.

Hind wings with five to eight cubital crossveins, radial sector 3- or 4-branched.

Expanse, 37 to 45 mm.

MINDANAO, Davao Province, Mount Apo, Galog River, altitude 6,000 feet, October 18 to 23, many specimens (*Clagg*). Type, M. C. Z. No. 22102.

Separated from *N. obliqua* by paler antennæ, darker venation, slightly closer ocelli, and larger size.

NEOPERLA CLAGGI sp. nov. Plate 2, fig. 21.

Extremely similar in structure and size to *N. bakeri*, differing in darker body and legs, and wings fumose throughout, veins brownish; male with long anterior process of clasper heavier than in *N. bakeri* and the lower process shorter and blunter; ventral plate of female straight across.

Ocelli two diameters or a little more apart, and fully twice as far from eyes; lateral scars a little farther from ocelli than the latter are apart, and plainly nearer to eyes; pronotum almost as wide as head, corners and sides rounded. Forewing with one or two crossveins beyond subcosta; two or three costal crossveins before end fine (not thickened as others), radial sector usually 2-branched beyond radial crossvein.

MINDANAO, Davao Province, Mainit River, altitude 6,500 feet, October 27, and Galog River, 6,000 feet, October 18, both on Mount Apo (*Clagg*). BASILAN (*Baker*), a slightly smaller specimen. Type, M. C. Z. No. 22103.

NEOPERLA PALLICORNIS sp. nov.

Face yellowish, faintly brownish in middle, antennæ wholly pale; pronotum pale brownish; thorax and abdomen mostly yellowish, setæ also, the tips but little darker; wings faintly yellowish, veins yellow. Lateral carinæ of face not extending back; ocelli one and one-half diameters apart, and fully twice as far from eyes, eyes rather elongate, somewhat pointed in front and behind; lateral scars moderately large, fully as close to ocelli as to eyes.

Pronotum much broader in front than long, anterior angles sharp, prominent, sides much sloping behind; margin of ventral plate straight. Forewings with cubital fork arising at acute angle much before crossvein; costals all thickened, two crossveins beyond subcostal; radial crossvein scarcely oblique; radial sector with one or two branches beyond crossvein; second anal almost parallel to first, third anal slightly sinuate; about six crossveins in both median and cubital areas. In hind wings four or five cubital crossveins.

Expanse, 24 mm.

LUZON, Laguna Province, Mount Maquiling, 2 females (*Baker*). Type, M. C. Z. No. 22104.

A male, which probably belongs with these females, differs in having the head and basal joint of antennæ somewhat darkened, and the veins are faintly brownish; the genitalia have the apical process stouter towards base than in *N. recta*, and there is no tubercle or process in front of it, only a small scabrous area.

HEMEROBIDÆ

Key to the Philippine species of Archæomicromus.

1. Four or five radial sectors; outer gradates irregular, not parallel to inner series *igorotus*.
- More radial sectors; outer gradates in a more even row..... 2.

2. Five to six radial sectors; wings scarcely marked; tibiae not banded, first median cell usually shorter than second, hardly if any longer than its pedicel to the basal crossvein..... *pusillus*.
Seven to ten radial sectors; wings more marked with dark; tibiae often banded with dark 3.
3. Front and midtibiae bifasciate, hind tibiae with three bands behind, also marks on femora; seven radial sectors; first median cell longer than second; three dark spots along basal cubitus..... *pictipes*.
Hind tibiae without bands 4.
4. First median cell plainly shorter than second; eight to nine radial sectors; veins between gradate series pale, almost unmarked, front tibiae bifasciate; pronotum with two dark spots..... *placidus*.
First median cell fully as long or longer than second, and very much longer than its pedicel..... 5.
5. Seven to eight radial sectors; upper three of inner gradates not much separated from others; veins between gradate series much marked, as elsewhere; top of head and pronotum black; only small spot before stigma *nigrifrons*.
Ten radial sectors; upper three of inner gradates widely separated from others; upper end of outer row much incurved; veins between gradate series scarcely marked; both gradate series heavily bordered; head and pronotum pale; large spot before stigma..... *gratus*.

MICROMUS (ARCHÆOMICROMUS) PICTIPES Banks.

I know only the type from Baguio, Benguet Subprovince, Luzon (*Baker*).

MICROMUS (ARCHÆOMICROMUS) IGOROTUS Banks.

LUZON, Laguna Province, Mount Maquiling and Los Baños: Mountain Province, Baguio (*Baker*).

MICROMUS (ARCHÆOMICROMUS) PUSILLUS Gerst.

From many localities in Luzon. *Micromus philippinus* Navas, 1926, is the same species.

MICROMUS (ARCHÆOMICROMUS) GRATUS sp. nov.

Tawny or faintly rufous; vertex dark each side by the eye, basal joint of antenna dark brown, beyond brownish; pronotum with a dark spot on each side, lateral lobes of mesonotum dark; abdomen brown; legs pale, front and midtibiae faintly bifasciate with brown. Forewings with anal area narrowly dark brown, and a dark brown spot over connection of median and cubitus with an extension towards radius; inner and outer gradates dark brown and mostly bordered; several long streaks on radius; a large brown spot before stigma, a small one at end and another between them; radial sectors and branches of medius but little marked, but not yellowish, scarcely at all marked between the gradate series.

Hind wings with outer gradates, cubitus and its branches, and some veins near upper base dark, stigma dark.

Wings moderately narrow; in forewing most of the gradates in fairly even series, but the upper three of inner row widely separated from the others, the upper four of outer row turn that row inward; ten radial sectors; medius forks long before second cubital crossvein; first median cell longer than second, and very much longer than its pedicel; outer cubitus connected to medius by a distinct crossvein; basal cubital cell much widened before first cubital crossvein.

Forewing, length, 10 mm; width, 3.7.

MINDANAO, Davao Province, Mount Apo, Tia Ridge, altitude 6,500 feet (*Clagg*). Type, M. C. Z. No. 20207.

MICROMUS (ARCHÆOMICROMUS) PLACIDUS sp. nov.

Yellowish; face from between antennæ down on clypeus darker; basal joint of antennæ scarcely dark; pronotum with a large dark spot on each side, dark spots or stripes over lateral lobes of mesonotum; front and midtibiæ with two dark bands.

Forewings with several brown bands occupying most of anal area, a dark brown spot over connection of medius and cubitus, and both series of gradates dark brown, the inner row bordered; costals with a few dark spots, larger one before and after stigma, outer forks more or less dark, including the branches of medius, radial sectors before inner gradates also partly dark but almost wholly pale yellowish between the two series of gradates.

Hind wings with outer gradates, cubitus, and some veins near base dark.

Wings moderately narrow; eight or nine radial sectors, gradates (9 and 11) in nearly even almost parallel series, in inner row the upper two well separated, the medius forks much before second cubital crossvein, cubitus forked near this crossvein, outer fork connected to medius by a short crossvein; first median cell much shorter than second, but nearly as long as its pedicel.

Forewing, length, 6.8 mm; width, 2.5.

SAMAR (*Baker*). Type, M. C. Z. No. 20205.

MICROMUS (ARCHÆOMICROMUS) NIGRIFRONS sp. nov.

Face brown, a yellowish band below antennæ, vertex and pronotum black; basal joint of antennæ black, beyond brown; abdomen dark; legs yellowish, front femora dark, none of tibiæ plainly marked.

Forewing with anal region almost wholly dark brown and a prominent dark brown spot over connection of medius and cubitus, gradates dark and slightly bordered with brown, radial sectors and branches of medius mostly dark, with occasional pale streaks or spots, costals partly dark, small spots each side of stigma.

Hind wings with outer gradates dark brown, veins beyond and behind them more or less dark, venation before them mostly pale yellowish.

Forewings moderately narrow; in one wing cubitus connected to medius by a short crossvein, in the other united with it for a short distance, first median cell as long as second and very much longer than its pedicel; seven to eight radial sectors, eight inner gradates, ten outer, in nearly parallel series, the upper ones of the inner row not especially separated, outer row a little incurved at upper end; the medius forks long before second cubital crossvein.

Forewing, length, 7 mm; width, 2.8.

MINDANAO, Davao Province, Mount Apo, Galog River, altitude 6,000 feet (*Clagg*). Type, M. C. Z. No. 20206.

MICROMUS (MICROMUS) ANGUSTIOR Weele.

Common in the Philippines, especially in Luzon. *Nenus luzonica* Navas is the same species; *N. novitus* Navas, from Japan and Formosa, is very similar, but I think distinct. *Micromus linearis* Hagen, from Ceylon, also goes in this subgenus. The type of *Micromus* is *variegatus*, and in that the cubitus in hind wing runs into the medius, just as in the species of *Nenus*.

Key to the Philippine species of Hemerobius.

1. First median cell no longer than second, inner series of gradates incomplete and uneven; last radial sector with four branches before outer gradates *tagalicus*.
 First median cell much longer than second, sometimes twice as long; last radial sector with three branches..... 2.
2. Second subradial space much longer than first, space between the two gradate series not much narrower than the space beyond outer gradates *claggi*.
 Second subradial space not noticeably longer than first; space between the two gradate series narrower than the space beyond the outer gradates 3.
3. Male genitalia with lower process slender, projecting downward to lower edge of abdomen. Veins more dotted..... *rizali*.
 Male genitalia with lower process projecting outward, from the side small and knoblike, inwardly pointed; outer space of wing unusually wide; veins not or scarcely dotted..... *vagans*.

HEMEROBIOUS CLAGGI sp. nov.

Yellowish; a dark brown mark under each eye; pronotum broadly dark on each side, mesonotal lobes scarcely darkened; legs pale, unmarked.

Forewings with most veins interruptedly brown and pale, sometimes in streaks, often in dots; gradates and a few basal crossveins dark brown, margin with some pale yellowish spots, otherwise brown; stigmal area slightly darkened; hyaline line in costal area very distinct.

Hind wings with veins not dotted, but either pale brown (mostly near base) or yellowish, most of the gradates brown, stigma brownish.

Forewings with three radial sectors, the last one with three forks (not counting tiny apicals); second subradial cell much longer than first; gradates subparallel, intermediate area about as broad as apical area; six in inner gradates, seven in outer row; crossvein from medius to radius hardly its length before first radial sector; first median cell nearly twice as long as second.

Forewing, length, 7.5 mm; width, 3.

MINDANAO, Davao Province, Mount Apo, Kidapayan Trail, altitude 7,000 to 9,000 feet, September 18 to 20 (*Clagg*). Type, M. C. Z. No. 20209.

HEMEROBIOUS VAGANS sp. nov. Plate 2, fig. 24.

Yellowish; a brown stripe below each eye; pronotum broadly black on sides; legs unmarked. Forewings with veins marked with dark brown, mostly in streaks; gradates wholly dark brown, an irregular dark brown spot over the connection from cubitus to medius; stigma not strongly marked.

Hind wings with veins mostly pale brownish, outer gradates and cubitus darker. Forewing with three radial sectors, the last forked three times; first and second subradial spaces subequal; gradates (four and six) nearly parallel, space between the two rows much narrower than the apical area which is unusually broad; first median cell much longer than second. Male appendages not very prominent, the curved tip tapering to a point inwardly, before it a smaller process or tooth, seen from the side the tip somewhat knob-shaped.

Length, forewing, 7 mm; width, 2.8.

MINDANAO, Davao Province, Mount Apo, Seliban River, altitude 7,000 feet, September 11 (*Clagg*). Type, M. C. Z. No. 20208.

HEMEROBIUS RIZALI Banks. Plate 2, fig. 13.

LUZON, Benguet Subprovince, Baguio (*Baker*).

Hemerobius inversus Navas, 1927, is also from Baguio, and the description agrees except that Navas gives more gradates in inner than in outer series, a variable point; for his 5-branched last radial sector, he probably counts the two small ones near tip.

HEMEROBIUS TAGALICUS Banks.

LUZON, Nueva Vizcaya Province, Imugan (*Baker*).

Hemerobius baguiensis Navas, 1923, also from Baguio, is said to have a dark head, very long antennæ, and three radial crossveins; it would seem to be very different and perhaps of another genus.

Navas also describes *Megalomus exillatus* from the Philippines.

CHRYSOPIDÆ

The Chrysopidæ obtained by Clagg in Mindanao have induced me to go over all our Philippine species, and I have prepared synoptic tables of the two principal genera, *Ankylopteryx* and *Chrysopa*.

ANKYLOPTERYX BRAUERI sp. nov.

Whitish or pale yellowish; a black spot each side under eye, one each side on the clypeus, last joint of the maxillary palpi marked with dark; a black spot at middle of front and midtibiæ, the tips of the tarsi black, no dark elsewhere on the body.

Wings with venation largely pale; in forewings the outer ends of first few costal crossveins dark; origin of radial sector, several of radial crossveins toward stigma, and some branches of anal vein dark. Gradates, especially inner row, dark, inner row often faintly dark-bordered, a distinct brown cloud over the first two; in hinder and outer part of wing a dozen or more faint brown clouds, in outer part of wing these often in the bases of the marginal forks. Hind wings with similar faint clouds, but hardly as many, elsewhere venation pale, except second cubital crossvein dark.

The wings, in shape and venation, are generally similar to those of *A. doleschali*, and the divisory cell is as small as in that species. There are about six to eight gradates in each series, the outer series nearly parallel to the outer margin, the gradates of the inner series often rather widely separated from each other, the first two close together and transverse (as in *A. trimaculata* and *A. nonelli*).

Pronotum plainly longer than broad, narrowed in front.

Length, 10 mm; forewing, length, 13.5 to 14.5; width, 6.

MINDANAO, Davao Province, Batraeyon, and Galog, Seliban, and Sibulan Rivers, all on Mount Apo, altitude 6,000 to 8,000 feet, September to early October (*Clagg*). Type, M. C. Z. No. 20164.

ANKYLOPTERIX CLAGGI sp. nov.

Pale yellowish, face with the usual black spots below each eye and on sides of clypeus; also three black dots, one below base of each antenna, and one between the two; no other dark spots on head, none on tibiae; tips of tarsi pale.

Pronotum nearly twice as broad as long, unspotted, mesonotum with faint dark marks in front and at base of forewings. Venation greenish; forewing with costa at base and two or three of the basal costal crossveins black, origin of radial sector and the first crossvein behind it black, several radial crossveins before stigma, both series of gradates dark, inner series darker than outer; a branch from cubitus to hind margin of wing near middle black and broadly black-margined; very faint clouds of brown on some of the marginal forks, a few crossveins near base of wing dark, including hind part of base of second cubital cell, a few cubital crossveins also faintly margined; stigma green. Hind wings with green veins and stigma, a few faint clouds near hind margin.

Forewings with costal area at base less broad than usual (but much more than in *Chrysopa*); divisory cell triangular, of fair size; about eight gradates in each series, far apart, outer row parallel to outer margin, inner row directed towards stigma; radial sector about as curved as usual in the genus.

Length, 9 mm; forewing, length, 13; width, 5.

MINDANAO, Davao Province, Mount Mayo, altitude 4,000 to 5,000 feet, January (*Clagg*). Type, M. C. Z. No. 20165.

By the narrower costal area this species approaches *Chrysopa* and particularly *Ch. nigribasis* Bks., and the latter species may be removed to *Ankylopteryx*. However, in *A. claggi* the face marks and the much curved radial sector are characteristic of *Ankylopteryx*.

Key to the Philippine species of Ankylopteryx.

1. No divisory veinlet in third cubital cell..... *anomala*.
This veinlet present, setting off a small cell in upper basal part of third cubital cell 2.

2. Front and midtibiæ with a median dark spot..... 10.
Front and midtibiæ unspotted..... 3.
3. Black across base of mesothorax..... 4.
Not so marked 5.
4. Three large black spots in each wing, costal area as wide as usual at
base, average size *nonelli*.
No large dark spots on wings, costal area not near as wide as usual,
small size *Chrysopa nigribasis*.
5. Wings unmarked, veins wholly pale..... *perpallida*.
Wings more or less marked..... 6.
6. Forewings with some of the discal veins broadly margined with yellow-
ish brown 7.
Forewings without such yellowish marks..... 8.
7. Last crossvein between radial sector and medius giving off two branches,
radial sector extremely sinuous, many brown clouds..... *obliqua*.
That crossvein not giving off two branches, radial sector less sinuous,
fewer brown clouds *nervosa*.
8. Only outer gradates black, radial sector strongly sinuous..... 9.
All gradates black, and also a broadly margined branch of cubitus to
hind margin; three dark dots on face..... *claggi*.
9. No dark spot over base of inner gradates..... *polygramma*.
A dark spot over base of inner gradates, stigma distinct, divisory cell
usually 4-sided Ceylon species.
10. No dark spot over base of inner gradates, outer gradates only black,
radial sector very sinuous, stigma indistinct..... *polygramma*.
A dark spot over lower base of inner gradates, stigma and a spot near
end of anal vein usually also present..... 11.
11. Divisory cell very small, 2- or 3-sided..... 12.
Divisory cell normal, often 4-sided..... 13.
12. Stigma usually marked, pronotum with a spot each side.... *doleschali*.
Stigma not marked, pronotum without spots, outer gradates dark.
braueri.
13. Thorax unmarked, stigma marked..... *punctata*.
Thorax with some dark spots..... 14.
14. Mouth pale, smaller species, stigma not marked..... *borneensis*.
Mouth dark, stigma usually and a spot near end of anals dark.
octopunctata (trimaculata), candida (sigillaris).

CHRYSOPA EXCELSIOR sp. nov.

Head rather dark, discolored, but without black marks; antennæ, palpi, and legs pale; thorax pale yellowish, pronotum with a black spot each side near middle of extreme lateral margin. Forewings with longitudinal veins pale, many crossveins dark, at least in part; costals for one-half way out, most of radials, origin of radial sector, medials, both series of gradates, cubitals, and anals marked with dark; stigma yellowish; in hind wings venation pale.

Forewings with costal area as broad as radial area; post-cubital area about twice as broad as cubital area; divisory veinlet

ending much beyond crossvein; about seven crossveins in each gradate series, inner series irregular, the first towards base, third, fourth, and fifth close together and more transverse than first and second; outer series even, about as near to inner row as to outer margin, to which it is parallel.

Pronotum nearly as long as broad, a little narrowed towards front.

Length, 10 mm; forewings, length, 15; width, 5.

MINDANAO, Davao Province, Mount Apo, Seliban River, altitude 7,000 feet, September 13 (*Clagg*). Type, M. C. Z. No. 20166.

CHRYSOPE NOTULATA sp. nov.

Head pale, unmarked, likewise palpi, antennæ, and legs; thorax yellowish, pronotum with two small dark submedian spots in the front part, and faint short lines in the hind part. Forewings with longitudinal veins greenish, many costals on basal part black, but not the first two or three, several radials dark in middle, some branches of cubitus and a few in anal area dark; inner gradates dark, outer series pale, origin of radial sector and bases of branches of radial sector pale, stigma pale greenish.

Hind wings with greenish venation; forewings with costal area as broad as radial area; divisory veinlet ends much beyond crossvein; second crossvein from anal to cubitus scarcely oblique; about seven veinlets in each gradate series, first and second more basal, others in even row, about parallel to outer row, but nearer to radial sector than to outer row, outer row thus much nearer to outer margin than to inner gradates; post-cubital area only about one-half wider than cubital area.

Pronotum much broader than long, scarcely narrowed in front.

Length, 11 mm; forewing, length, 15; width, 5.

MINDANAO, Davao Province, La Lun Mountains, May 3 (*Clagg*). Type, M. C. Z. No. 20167.

CHRYSOPE DEROTA sp. nov. Plate 2, fig. 16.

Head pale, unmarked; palpi, antennæ, and legs pale, thorax also, pronotum with a dark spot each side towards, but not on, the lateral margin.

Forewings with longitudinal veins greenish, most of costal crossveins, nearly all of radials, base of radial sector, bases of branches of radial sector, medials, most of cubitals, and anals in part dark; both series of gradates dark; stigma yellowish green; hind wings with pale venation.

Forewings with costal area plainly not as broad as radial area; divisory veinlet ending much beyond the crossvein; seven or eight veinlets in each gradate series, fairly evenly placed, the rows subparallel and also to the outer margin, inner row about as near to the outer as to radial sector, outer row as near to the inner as to the outer margin; postcubital area not nearly twice as broad as the cubital area.

Pronotum much broader than long, scarcely narrowed in front. Length, 9 mm; forewing, length, 12; width, 4.5.

MINDANAO, Davao Province, Mount Apo, Mainit River, altitude 6,500 feet, October 22 (*Clagg*). Type, M. C. Z. No. 20168.

A specimen, not fully colored, from Sandakan, Borneo, may belong to this species.

CHRYSOPA MINDANENSIS sp. nov. Plate 1, fig. 11.

Pale yellowish; face, palpi, antennæ, and head unmarked, except two very small black spots on front of the vertex near middle; thorax green on sides, broadly yellow through the middle, pronotum faintly reddish on sides; abdomen green on sides, a pale median stripe above; legs wholly pale.

Wings with longitudinal veins green; forewings with gradates and many crossveins dark, several costals towards base at least in part dark, the first few radials at least partly, several cubitals, divisory veinlet, origin of radial sector, and some anal crossveins dark; stigma greenish; hind wings with green veins, no marks, except inner gradates somewhat darkened. Forewings moderately long, cubitus swollen towards base, divisory ends just beyond crossvein; eight to ten in each gradate series, outer row subparallel to outer margin, and very much nearer to margin than to inner series, inner row also subparallel to outer margin, about as near radial sector as to outer row.

Pronotum much broader than long, a little narrowed in front. Length, 9 mm; forewings, length, 12.5; width, 4.5.

MINDANAO, Davao Province, Mount Mayo, altitude 4,000 to 5,000 feet, January 26 (*Clagg*). Type, M. C. Z. No. 20169.

CHRYSOPA APOANA sp. nov. Plate 2, figs. 22 and 23.

Head, antennæ, and palpi pale, unmarked; pronotum pale, with a large black spot each side behind, no marks on rest of thorax; legs pale. Wings with longitudinal veins mostly pale, but radial sector for a short distance and median by the second cubital cell black; costal crossveins for nearly halfway out more or less black, radial crossveins at first black, then black

only in the middle, a few medial and a few cubital crossveins towards base black, outer gradates black, inner pale; stigma greenish, a few anal crossveins also dark; hind wings with wholly pale greenish venation.

Pronotum broader than long, narrowed towards front. Wings moderately long, many of the crossveins a little more oblique than usual, radial crossveins beyond first five or six oblique and sinuous, the last few short ones straight across (like those in *C. obliquata*); hairs on veins not as long as in *C. obliquata*. About eight veinlets in each gradate series, veinlets often shorter than the distance apart, outer series nearly parallel to outer margin, inner row about as near to outer row as to radial sector and nearly parallel to outer row, divisory veinlet ending much beyond crossvein.

Length, 10 mm; forewing, length, 15; width, 5.

MINDANAO, Davao Province, Mount Apo, Mainit River, altitude 6,000 feet, September 22 (*Clagg*). Type, M. C. Z. No. 20170.

This species (with my *Ch. obliquata*) will go in the Navasian genus *Scoliochrysa*, because of the sinuous veins in the radial area; the character varies so gradually to the straight veins of typical *Chrysopa* that the genus is but a synonym of *Chrysopa*.

Key to the Philippine species of Chrysopa.

1. Antennæ black or almost black..... 2.
Antennæ pale 4.
2. Forewing more than 15 mm, head reddish, hairs on veins very short.
ruficeps.
Forewing less than 15 mm..... 3.
3. Basal joint of antennæ with a black mark..... *flaveola.*
Basal joint of antennæ unmarked..... *eurycista.*
4. Apical cells of forewing containing golden iridescent spots.... *splendida.*
No such golden spots..... 5.
5. Stigma very plainly dark at one or both ends, dark marks on head,
and on thorax above and below base of front wing..... 6.
Stigma not plainly dark at either end, no such marks on thorax..... 9.
6. Tibiæ with black spots near base and at middle, pronotum margined;
usually but three or four veinlets in each gradate series..... *bakeri.*
Tibiæ without black marks, a black spot between antennæ, usually five
veinlets in each gradate series..... 7.
7. Costals largely black, as also most of radials, and bases of the branches
of radial sector *rizali.*
Costals scarcely, if at all, dark..... 8.
8. Two spots on vertex, and a large spot each side on pronotum towards
front *valdezi.*
No spots on vertex or pronotum, at most very small faint ones.
caliptera.

9. Second joint of antennæ dark..... 10.
 Second joint of antennæ pale..... 11.
10. Face mostly dark with red or brown, with red spots below antennæ.
atrioris.
 Face pale *azygota.*
11. Thorax with black across base of mesothorax, costal area broad at base *nigribasis.*
 Not so 12.
12. At least one row of gradates dark, as also some other crossveins..... 13.
 Gradates pale, as is rest of venation..... 21.
13. Radial crossveins near stigma very oblique and sinuous..... 14.
 Radial crossveins scarcely oblique and not sinuous..... 15.
14. A large black spot on each side of pronotum..... *apoana.*
 No such spots on pronotum..... *obliquata.*
15. A dark mark on each side of face from eye to mouth..... 16.
 No dark mark on face, costals towards base partly black..... 17.
16. Costal pale, only two gradate series..... *ilota.*
 Costals and radials largely dark, a partial third (intermediate) row of gradates *winkleri.*
17. A distinct black spot near each lateral margin of pronotum..... 18.
 No such black spots 19.
18. Inner gradates irregular, third, fourth, and fifth close together; costal area as broad as radial area..... *excelsior.*
 Inner gradates in fairly even row; costal area not so broad as radial area *derota.*
19. Basal joint of antennæ reddish on outer side, the red showing also between antennæ and eyes, inner gradate series extended basally.
alticola.
 Basal joint of antennæ not reddish, no red on head..... 20.
20. Outer gradates pale, thorax with a broad yellow median stripe.
mindanensis.
 Outer gradates dark, pronotum with a pair of small submedian dark spots *notulata.*
21. Postcubital area scarcely, if at all, broader than cubital area, pronotum broad, inner gradates reduced to three or four..... *isolata.*
 Postcubital area plainly broader than the cubital area..... 22.
22. Pronotum twice as broad as long, and with a median yellow stripe.
maquilongi.
 Pronotum not twice so broad as long..... 23.
23. Inner gradate series with upper veinlet fully twice as near to radial sector as to outer gradate row..... *tagalica.*
 Inner gradate series with upper veinlet not nearly twice so close to radial sector as to outer gradate row..... *morota.*

Chrysopa procubitalis Navas is, I think, *C. ruficeps* McLachlan.

Chrysopa faceta Navas is *C. splendida* van der Weele.

Chrysopa buruana E. Petersen is close to and probably the same as, *C. bakeri*; the type of *C. bakeri* has the outer margin very dark, but one from Luzon is more like Petersen's figure; a specimen from Basilan lacks the spots on the vertex.

Chrysopa boettcheri E. Petersen is surely *C. bakeri*.

Chrysopa herasi Navas, and I think *C. unicolor* Navas also, are the same as *C. morota* Bks.

Chrysopa maquilingi is a new name for *C. inconspicua* Navas, 1926; Navas had used the same name for a West African species in 1914.

Chrysopa formosana E. Petersen is, according to a paratype sent me by M. E. Petersen, different from *tagalica*, having the inner gradates much nearer to the outer ones, and differing in other respects. However, specimens later sent me as *C. formosana* from the Philippines are *C. tagalica* Bks.

Chrysopa nigribasis Bks. approaches *Ankylopteryx*, and I have inserted it in both tables. The costal area is broader, and the radial sector more curved than usual in *Chrysopa*, but not as much so as in normal *Ankylopteryx*; however, the new *A. claggi* is more like *C. nigribasis* in these respects.

Chrysopa winkleri Navas is the basis of his genus *Bornia*, based on the extra series of gradates; the number of veinlets in this extra series is variable, probably never complete, and other species of *Chrysopa* sometimes show one or two extra veinlets; on that character the genus is invalid.

Chrysopa obliquata and *C. apoana* would go in the Navasian genus *Scoliochrysa*, based on the oblique and sinuous radial crossveins in a Papuan species. The amount of obliquity is variable and in several other species plainly a little oblique, so that that generic name must fall.

Chrysopa splendida Weele is the basis of *Glenochrysa*, but this species is plainly related to *C. rizali* and *C. bakeri* (*buruana*).

If these generic names are to be valid, others should be given for the section *nigribasis*, for the section of *ruficeps*, *flaveola*, and others, for the section of *morota*, *tagalica*, and others, as well as for numerous other sections in other countries. The Navasian genus *Cintameva* has already been shown to be typical *Chrysopa*, and the genus *Chrysocera* Weele is based on a character only in male appendages and of variable development, so also falls to *Chrysopa*.

OSMYLIDÆ

HELIOSMYLUS MONTICOLUS sp. nov.

Face yellowish, basal joints of antennæ also, beyond brown, vertex brownish, pronotum also brown, darker on sides, rest of thorax and abdomen brown, latter dark brown above; legs pale, faint spots on tibiæ.

Forewings with largely brown veins, many bordered, five or six brown streaks between subcosta and radius, the veins adjoining brown; a large brown spot each side of the pale yellowish stigma; outer gradates heavily brown, a spot over and near next to last median crossvein, and another before that. Hind wings with spots, stigma, outer gradates, and some along median before it brown, other veins pale brownish, the outer border with some pale places.

Forewing with about fifteen or sixteen radials, about seventeen cubital crossveins, and thirteen branches to radial sector; veins densely haired as in *H. fraternus*.

Forewing, length, 21 mm; width, 7.

MINDANAO, Davao Province, Seliban River, altitude 7,000 feet, September 3; Galog River, altitude 6,000 feet, November 4; Baroring River, altitude 7,000 feet, November 9; all on Mount Apo; La Lun Mountains, July 4 (*Clagg*). Type, M. C. Z. No. 20204.

Paler and much less heavily marked than *H. fraternus* Bks., from Kinabalu; the latter species has but thirteen radial crossveins.

Key to the Philippine species of Spilosmylus.

1. Only two places with dark lines on subcosta and radius..... 2.
Four or more places with dark lines on subcosta and radius..... 3.
2. An amber streak reaching towards wing tip somewhat behind radial sector; apical costal area with two or three oblique brown marks; bulla very large; venation of forewing almost wholly pale; hairs on costal crossveins pale, but little longer than width of cell; fifteen to seventeen radial crossveins before stigma..... *formosus*.
No such amber or brown streaks; many crossveins dark brown; pronotum with four brown spots, as also on mesonotum; some erect hairs on costal crossveins are black and equal the width of two cells; only twelve radial crossveins *proximus*.
3. Forewing with amber or golden bands, two across wing and one or two longitudinal towards tip; fourteen radial crossveins before stigma. *inquinatus*.
Forewing without such amber marks; usually twelve radial crossveins before stigma 4.
4. Four pairs of black lines on subcosta and radius, and a narrow black line between; marginal forks practically wholly pale; many crossveins wholly dark, no veins dotted with dark, bulla small; first anal crossvein scarcely oblique *alticolus*.
Five or six pairs of black lines on subcosta and radius, longitudinal or other veins marked with brown or dotted; first anal crossvein plainly oblique 5.
5. No interlineal lines between subcosta and radius; first crossvein from median to radial sector ends on first branch of radial sector.. *modestus*.

Interlineal lines between subcosta and radius, sometimes interrupted with snow white; first crossvein from median to radial sector at or before origin of first branch of sector..... *apoanus*.

SPILOSMYLUS INQUINATUS McLachl.

Specimens from Luzon and Samar. The amber marks on the wings are characteristic; *S. lineatus* Navas, 1912, and *S. nephelius* Navas, 1926, agree in their descriptions with *S. inquinatus*.

SPILOSMYLUS FORMOSUS Banks.

Only the type, from Surigao, Mindanao.

SPILOSMYLUS MODESTUS Gerst.

One from "Philippines, Thorey," Hagen collection, others from Sandakan, northern Borneo. Extremely close to *S. tuberculatus* Walker; I find about the only difference is that in *S. modestus* there are more crossveins in the middle of the wing that are wholly white than in the two *tuberculatus* that I have from the Malay Peninsula.

SPILOSMYLUS PROXIMUS sp. nov.

Yellowish; face with faint dark spots below antennæ and on clypeus, vertex slightly darkened, antennæ pale; pronotum pale, a pair of dark spots in front part, and more elongate ones in hind part; four rounded dark spots on mesonotum and on anterior and lateral lobes; pleura and legs pale, tibiæ unmarked; abdomen faintly brownish. Forewings pale, a small dark cloud near middle of hind border; venation mostly very pale, costals unmarked, longitudinal veins scarcely at all dark, many crossveins in middle of wing wholly dark. Subcosta and radius with dark lines in only two places, the first near middle of wing, no line between these veins, and this space scarcely yellowish. Many of the hairs on costal crossveins, especially towards base, extremely long, erect, and black.

Hind wings with venation almost wholly pale.

Forewing with first crossvein from median to radial sector much before first branch of radial sector; twelve radial crossveins before stigma, twelve cubital crossveins, eleven branches of radial sector.

Forewing, length, 19 mm; width, 7.

MINDANAO, Davao Province, Galog River, altitude 6,000 feet, October 22 (*Clagg*). Type, M. C. Z. No. 20201.

SPILOSMYLUS ALTICOLUS sp. nov.

Head pale, face polished, without distinct marks; antennæ pale yellow, as also pronotum, latter with a black spot on each

side in front and behind, meso- and metanotum pale, unmarked, as likewise pleura; legs pale, unmarked; abdomen rather darker near tip.

Forewings hyaline; most veins pale, none dotted with dark; subcosta and radius with four pairs of black lines, and a narrow black line in membrane between, this space scarcely yellowish; costals wholly pale, many other crossveins dark, and branches of radial sector often partly dark; outer marginal forks pale, but a faint brown cloud parallel to outer margin, a little way back from it; bulla small, with two submedian dark lines, and a spot each side. Hind wings almost wholly pale, but the outer two rows of gradates dark, as also some streaks on radius and subcosta. Forewing with twelve radials, before stigma, twelve cubital crossveins, ten branches to radial sector, and first anal crossvein scarcely oblique (in most species very plainly so).

Forewing, length, 16 mm; width, 6.

MINDANAO, Davao Province, Mount Apo, Sibulan River, altitude 7,000 to 8,000 feet, September 6 (*Clagg*). Type, M. C. Z. No. 20202.

SPILOSMYLUS APOANUS sp. nov.

Head yellowish, polished, a faint dark mark on middle of lower face; antennæ pale yellowish; pronotum also yellowish and without definite marks, meso- and metanotum as well as pleura pale, unmarked; abdomen scarcely darker near tip; legs pale, faint marks on front and midtibiæ. Wings hyaline, veins pale, but often dotted with brown or with brown streaks, many crossveins through middle area of wing wholly dark brown and slightly bordered, the next to last median crossvein very broadly bordered, forming a prominent spot. Five pairs of streaks on radius and subcosta, the space between plainly yellowish, with a dark stripe between each pair of streaks, in some places that space hyaline white and the dark streak broken in the middle to form two exclamation marks. Bulla very similar to that of *S. modestus* and with a faint brown cloud above it; outer marginal forks mostly brown; usually a few small clouds of brown in apical gradates dark, and most other veins marked or dotted with brown. Forewings with twelve radial crossveins before stigma, one beyond, ten branches of radial sector, eleven or twelve cubital crossveins, first anal crossvein very oblique; first median crossvein to radial sector ends on the sector at or before the working of sector.

Forewing, length, 17 mm; width, 6.

MINDANAO, Davao Province, Seliban River, altitude 7,000 feet, September 3; Galog River, altitude 6,000 feet, September 8 and 12; both on Mount Apo (*Clagg*). Type, M. C. Z. No. 20203.

Three females (?) without bulla, from Seliban River, Galog River, and Tia Ridge, apparently belong with the specimens cited above; they are similar in markings, but the veins are more dotted and with fewer brown streaks; the subcosta and radius show a few dark streaks, and in some places an intermediate dark line. This species closely resembles *S. modestus*; but the dark streaks between radius and subcosta, and the first median crossvein ending before the fork, as well as the lack of pronotal marks, separate it.

CONIOPTERYGIDÆ

PARASEMIDALIS TAGALICA sp. nov. Plate 2, fig. 15.

Head yellowish, antennæ blackish brown, thorax above pale, with a large rounded brown spot on each lateral lobe of mesonotum, pleura and legs pale; wings an even gray color, unmarked. Antennæ of male very heavy, joints in basal part more than twice as broad as long. Forewing with crossvein from radial sector to radius well out on the fork; crossvein from cubitus to medius ending on medius nearly its length before the fork. Hind wing with crossvein from radius to sector out on the fork, no distinct crossvein from radial sector to medius.

Length, 1.8 mm.

MINDANAO, Davao Province, Calian, June 20; Lawa, May 5 (*Clagg*). Type, M. C. Z. No. 20210.

HELICOCONIS NOTATA Navas.

MINDANAO, Davao Province, Mount Apo, Seliban and Mainit Rivers, altitude 6,000 to 8,000 feet, September 8 to 10 (*Clagg*). LUZON, Mount Banahao.

SPILOCONIS INTERRUPTA sp. nov. Plate 2, fig. 14.

Face yellowish, dull; palpi dark; vertex pale, very much elevated, fully twice as broad as long, truncate in front, anterior corners rounded. Basal joint of antennæ and the next two yellowish, then eight joints blackish, then two yellowish, then five blackish, the rest pale. Notum and pleura brown, legs pale. Wings of an even gray color, no spots, radial sector and apical crossveins narrowly margined with hyaline; base of radial sector and crossvein back to medius wholly hyaline; medius with a small swelling a little before, and another about equally far

beyond, the crossvein; median and cubital crossveins interstitial, the three apical crossveins also forming a straight line across; radius near the base much bent.

Length, 2 mm.

MINDANAO, Davao Province, Mount Apo, Batraeyon, altitude 8,000 feet, September 14 (*Clagg*). Type, M. C. Z. No. 20211.

SERICOSTOMATIDÆ

GCERA DISPARILIS sp. nov. Plate 5, fig. 44.

Head with yellowish hair, maxillary palpi with dark, white-tipped hairs; basal joints of antennæ pale, beyond brown and towards tip nearly black; most of the hairs on basal joint of antenna and on upper side of thorax dark with white tips; similar hairs on veins of forewings, particularly the costa, here some with the basal part plainly thickened, the fringe of similar black hairs, but usually without white tips; membrane of forewing, which is brownish, clothed with short golden hairs; hind wing gray to mostly black hair, fringe black; legs rather yellowish, tarsi darker, spurs black; abdomen dark brown. Venation of forewing normal (much as in *G. conclusa*), fork 1 going back almost halfway on discal cell. Hind wings with apical cells very long and slender, discal cell also very long, fork 2 reaching almost halfway to base of wing, fork 3 reaching back almost as far as fork 1. Female with hind tibiæ more curved even than in male, and in both a few of the short yellow spines of tarsi on the apical part of tibiæ.

Male genitalia on the plan of *G. impar* Ulmer, a pair of long, median, smooth, dark pieces close together, with blunt (not acute) tips, basad of these a pair of 2-jointed hairy flaps (*impar* shows only the apical joint), outside a very bristly lateral piece, longer than in *G. impar*; beneath, the lower plates show no inner, lobelike, hairy extension like that in *G. impar*, and the long, smooth, pear-shaped appendages with tapering tips reach almost as far out as the superior median pieces.

Sixth ventral segment with only three (five in *impar*) spines, the median one longer and, though enlarged at tip, the tip slightly bilobed.

Forewing, length, 9 mm.

MINDANAO, Davao Province, Mount Apo, Batraeyon, altitude 8,000 feet, September 14, and Sibulan River, altitude 2,000 feet, November 13 (*Clagg*). Type, M. C. Z. No. 22048.

GÖERINELLA APOANA sp. nov. Plate 5, figs. 49 and 51.

Brown, thoracic notum sometimes slightly yellowish, wings brown, costal area of forewings heavily black-haired; basal joint of antenna dark brown, beyond very pale; legs yellowish, spurs brown. Basal joint of antenna as long as head width, plainly a little bowed outward, densely clothed on inner side with short black hair, elsewhere with longer brown hairs; palpi at tip with dense short hair. Forewings with discal cell about as long as its pedicel; fork 1 only a little way back on discal cell, fork 2 as far back as 1, fork 3 rather broad at base, not as far back as base of discal cell; lower branch of cubitus at the crossvein bending down and uniting with anal for a short distance.

Lateral male appendages rather heavy, upcurved, inner tip with an elongate lobe or process, on outer tip a stiff tuft of dense black hair, so that the appendage appears bifid; superior appendages slender and forked, but from above the forking scarcely visible.

Female similar to male; basal antennal joint about as long as in male, but not bowed, and with much long hair; forewings with discal cell almost equal to its pedicel; forks 1 and 2 as in the male, fork 3 also just as long as fork 2, fork 5 not reaching back to the crossvein; second anal vein bending down before its end so that it almost touches the hind margin.

Expanse, 16 to 17 mm.

MINDANAO, Davao Province, Mainit River, altitude 6,000 feet, September and October; Galog River, altitude 6,000 feet, September 1 to November 8; and Sibulan River, altitude 7,000 to 8,000 feet, September 6; all on Mount Apo (*Clagg*). Type, M. C. Z. No. 22049.

GÖERINELLA BICOLOR sp. nov. Plate 5, fig. 45.

Head and thorax yellowish, abdomen and wings brown, antennæ dark brown, apical part almost black, legs yellowish, darker towards tips, hind tibia broadly dark in the middle. Basal joint of antenna longer than width of head, straight, densely long-haired all around. Vertex with partly yellowish hair from the warts, thorax with mostly gray hair, on sides some yellowish.

Forewing with discal cell extremely long and slender, much longer than its pedicel, fork 1 reaching back on discal cell much more than width of cell, fork 2 reaching back on discal cell

nearly width of cell, fork 3 arising plainly before fork 2, fork 5 reaching back to crossvein; apical cells all very long and narrow.

Expanse, 24 mm.

MINDANAO, Davao Province, La Lun Mountains, July 4 (*Clagg*). Type, M. C. Z. No. 22050.

CALAMOCERATIDÆ

ANISOCENTROPUS NITIDUS sp. nov. Plate 5, figs. 46, 50, and 52.

Head yellowish to gray, a tuft of yellowish hair inward from each eye and below antenna, some yellowish hairs on vertex; antennæ with basal joint pale, then brownish, especially above, for six to eight joints and gradually becoming pale, and below snow white for most of length. Thorax yellowish, rather brown in middle above, shining; legs pale, hind legs more gray to brown, the apical half of tarsi snow white, tibia and basal part of tarsus with long fringe, spurs scarcely darker than legs. Maxillary palpi with yellowish gray to almost brown hair, some short hairs nearly black; first and second joints subequal, third almost twice as long as second, fifth as long as third, fourth and sixth subequal, and each about two-thirds of fifth.

Forewings almost uniform brown, shining, sparsely clothed with short black hairs, denser towards the tip, the fringe here black, costal area slightly darker than elsewhere, veins a little darker than wing; hind wings gray, with gray hair.

Forewing slenderer than in most species; radius runs out parallel to subcosta till near tip where it forks, continuous curve running into costa, branch running into first apical sector. A crossvein from subcosta to radius above middle of discal cell, latter moderately slender; fork 1 back on discal cell hardly its width, fork 2 a still shorter distance on discal cell, fork 3 going a little before the radio-median crossvein, and the same distance before median crossvein, fork 4 hardly reaches crossvein and fork 5 to just a little before crossvein. Hind wing with fork 1 very long and slender, forks 2 and 3 much shorter and subequal, fork 5 about as long as 3, but much wider throughout, crossvein back to medius very oblique.

Male genitalia with a pair of slender superior appendages, tipped with long stiff hairs, a smooth, reddish, lateral spine shorter than superior appendage, and a pair of lower appendages, also shorter than the superior pair, and with extremely long hairs from near tip.

Forewing, length, 10 to 12 mm.

MINDANAO, Davao Province, Mainit River, altitude 6,000 to 6,500 feet, September 14, 22, and 24, October 23 and 24; Galog River, altitude 6,000 feet, September 26 and November 6; Sibulan River, altitude 8,000 feet, September 6; all on Mount Apo (*Clagg*). Many specimens. Type, M. C. Z. No. 22052.

This species resembles *Ganomema pallicorne* McLachlan, but is much smaller.

LEPTOCERIDÆ

*Key to the Philippine species of *Æcetis*.*

1. In hind wing the crossvein runs to medius before forking of medius.... 2.
In hind wing the crossvein connects the forks..... 4.
2. Antennæ of male thickened on the basal part; size moderate.
crassicornis.
Antennæ of male not thickened; very small species..... 3.
3. In forewing besides the hairs there are black broad-tipped scales along the veins; fork 4 does not reach the crossvein, crossvein from radial sector to medius before end of discal cell..... *apicipennis*.
In forewing no such scales; fork 4 reaches the crossvein, crossvein from radial sector to medius just beyond end of discal cell..... *claggi*.
4. Anastomosis in one transverse line; fork 4 hardly reaches crossvein; fringe extremely long *pilosa*.
Anastomosis widely disjointed; fork 4 goes back before crossvein; fringe moderate *separata*.

Æcetis apicipennis Banks was described as a *Setodes*; it is very similar to *Æcetina angusta* Banks, of Borneo; both have the peculiar black scales; these and some of the others will doubtless constitute new genera some day.

ÆCETIS CLAGGI sp. nov. Plate 6, fig. 56.

Head, legs, and antennæ pale yellowish, almost white, latter annulate with brown; thorax and abdomen more rufous. Forewings nearly clear, crossveins brown; membrane and veins and margin with many long pale hairs; hind wings pale, with pale hair and fringes.

Forewings very slender, front and hind margin nearly parallel, discal cell extremely long and slender, fork 1 back scarcely a bit on discal cell, fork 4 reaching scarcely before crossvein; crossvein at end of discal cell a little before crossvein to medius, crossvein from medius to fork 4 a considerable distance before the others, branch of cubitus still farther before the last crossvein; anal vein running out a long distance beyond this branch close and parallel to the hind margin. Hind wings with crossvein ending long before fork of medius, fork 3 no longer than its pedicel; work 5 fairly long.

Male genitalia with a pair of large elliptical plates above, covered with short white hair, arising from below a pair of long upcurved slender spines.

Forewing, length, 4.5 mm.

MINDANAO, Davao Province, Mount Mayo, altitude 4,000 to 5,000 feet, January 26 (*Clagg*). Type, M. C. Z. No. 22055.

ÆCETIS SEPARATA sp. nov. Plate 6, figs. 57 and 59.

Pale yellowish; white hair on head and thorax above, abdomen white till near yellowish tip; antennæ, palpi, and legs pale yellowish, antennæ narrowly annulate with brown, very slender (not as in *Æcetodella*). Wings faintly grayish, with long fine gray to yellowish hair, very long on veins, fringe mostly pale, some brown patches along outer side, fringe beyond ends of anal veins very long and bright yellow; veins gray, over most of the forkings brown spots, one at end of anals, and one on subcosta at about middle of discal cell, crossveins brown, no spots at ends of apical veins; hind wings nearly hyaline, with yellowish gray hair and fringe.

Forewings with the anastomosis much disjointed, the radio-median crossvein long before the end of discal cell, median crossvein about halfway between them, discal cell longer than second apical vein, fork 1 back on discal cell about width of the cell. Hind wings with crossvein connecting forks as in *Æcetodella*.

Genitalia somewhat on the plan of *Æ. scutata* Ulmer, from Sumatra, but parts slenderer; lower appendages curving up nearly twice as far as in that species; median superior piece elongate, widened near middle, then narrowed a bit before the scarcely rounded tip; superior lateral appendages projecting from each side of median piece and longer than it, almost touching the end of lower appendages.

Forewing, length, 7 mm.

MINDANAO, Davao Province, Mount Mayo, altitude 4,000 to 5,000 feet, January 29 (*Clagg*). Type, M. C. Z. No. 22056.

ÆCETIS PILOSA sp. nov. Plate 6, fig. 58.

Pale yellowish, antennæ with tips of joints dark, male antennæ not swollen on basal part, thorax and tips of abdomen slightly reddish brown. Forewings faintly gray, with extremely long dark hairs on veins and along margins, posterior fringe more than one-half the width of wing; along outer half of costa the hairs very dense, making a brown streak, among the bases of these hairs are shorter ones, some of them snow white, and also some iridescent scales; between the veins are very few hairs,

mostly towards base; at anastomosis three tufts of black hair, another at base of fork 1 on upper edge of discal cell, a patch of dark brown hair at end of anal vein, three or four apical veins brown at tips; hind wings with brown hair on veins and along margin, the fringe behind in places longer than width of wing.

Forewing with discal cell much longer than its pedicel, fork 1 back on discal cell a little more than cell width, fork 4 not quite reaching to crossvein; crossveins of anastomosis nearly on a transverse line, and slightly brown. In hind wing the crossvein connecting the forks, fully twice its length from base of forks, the forks subequal in length, fork 5 rather short. Male genitalia show above at base a broad membranous plate, bent down on sides, tip broadly trilobed, lateral lobes ending in a dark knob, median lobe broad; ventral appendages hardly noticeable from side, moderately slender, tips slenderer, in one view with a deep inner emargination and an apical rounded lobe; two intermediate processes very slender, reddish.

Forewing, length, 7 mm.

LUZON, Laguna Province, Mount Maquiling (*Baker*). Type, M. C. Z. No. 22057.

TRIENODES BOETTCHERI Ulmer.

MINDANAO, Davao Province, Mount Apo, September to November.

Besides the row of black spots across the apical field, there are several black tufts on the anastomosis, and one near hind margin about halfway to end of anal vein.

SETODES FLAVIPENNIS sp. nov. Plate 6, figs. 60 and 62.

Pale yellowish; face, vertex, and thorax with white hair; forewings with rather bright yellowish hair, faintly annulate with brown in apical part; apical fringe yellowish, but a little brownish near extreme apex; hind wings hyaline, with long, white posterior fringe; legs yellowish; abdomen brown, with brown to greenish venter. In hind wings fork 1 small, but distinct, fork 3 a little shorter than pedicel, fork 5 large, a little before forking of median. In forewing pedicel of fork 1 fully one-third of fork, fork 3 a little before fork 1.

Male genitalia with upper appendages long and slender, but close together at base, inferior appendages with an erect bristly process above, and a smaller, more pointed one just beyond it. Penis with two divergent lobes at tip, seen from side there are two spines, the intermediate processes extremely slender.

Length, 5 mm.

NEGROS, Occidental Negros Province, Victorias, October 21, 1927, and November 1, 1927, at light (*W. D. Pierce*). Type in the United States National Museum; paratype, M. C. Z. No. 22053.

This species is evidently related to *S. spinosella* Ulmer, but the genital parts differ.

ALLOSETODES ASSIMILIS sp. nov. Plate 6, figs. 61 and 64.

Head with gray hair below, yellowish on vertex; antennæ pale, very plainly annulate with brown; palpi with brown hair, legs pale, tibiæ and tarsi brown. Forewings largely black, more uniformly so than in *A. plutonis*, with long black hair and small iridescent scales which appear golden in certain views; fringe black; hind wings dark, with black hair, and brown to black fringes. Forewing with discal cell much longer than its pedicel, fork 1 but little more than one-half its pedicel, fork 2 truncate at its base, third apical vein arising from near middle of end of discal cell, fourth and fifth apical cells also truncate at base, the branch of cubitus running into the anal vein which here almost touches the margin; in hind wings, which are very slender and pointed at tip, fork 1 very short, fork 2 nearly halfway to base of wings, with a short pedicel, median vein about opposite base of discal cell stopping and running no farther basad.

Male genitalia very similar to those of *A. plutonis*; with three slender pieces at base above, the median one forked at tip and hairy only at tip, side pieces shorter, with long bristles; below this is the long, down-curved, smooth median piece, somewhat shorter than in *A. plutonis*; below are the ventral appendages, from the side the basal part is thick, though at one place much constricted, and bears above near its base a slender upward projection tipped by a very long bristle (not seen in *A. plutonis*).

Forewing, 5 to 5.5 mm.

MINDANAO, Davao Province, Sibulan River, altitude 7,000 to 8,000 feet, August 31; Todaya Plateau, altitude 5,000 feet, September 12; Galog River, altitude 6,000 feet, September 26; all on Mount Apo (*Clagg*); Mount Mayo, altitude 4,000 to 5,000 feet, January 28 (*Clagg*). Type, M. C. Z. No. 22054.

When I described this genus (1931) I figured the venation of a denuded wing which proved to be abnormal; I have denuded another wing of *A. plutonis* and find it similar to that of *assimilis*, here figured, and much like that of *Triaxnodes*. The anal vein, however, runs in the apical part so close to the hind margin

as almost to touch it, and in *A. plutonis* the anal vein runs out at the end of the branch from the cubitus. In *A. plutonis* fork 2 is not so broad at base as in this species and not one-half as broad as the second apical cell; the hind wings are slenderer and more pointed than in *Triænodes*, thus the name may be retained, at least as a subgenus.

HYDROPSYCHIDÆ

HYDROPSYCHE FORCIPATA Ulmer. Plate 3, fig. 31.

What I take to be this species is common on Mount Apo up to 6,000 feet, and in other parts of Mindanao. The apical part of the claspers is as Ulmer figures them, the tip of the superior appendage has the pair of slender caliperlike pieces; in all my specimens there is a distinct swelling below the base of these processes not shown by Ulmer. The penis has the apical part as Ulmer figures it, but before this there is a flat process with a pair of teeth above at base, and each lateral part with two sharp teeth directed backward. However, I think there is no doubt about the identification; all my specimens are dry.

HYDROPSYCHE RIZALI sp. nov. Plate 4, figs. 39 and 41.

Head densely clothed with yellowish hair; thorax above with appressed yellowish hair; antennæ yellowish, narrowly banded with brown; palpi and legs pale yellowish, also spurs. Forewings yellowish, densely transversely marmorate with brown, apical fringe black in patches; hind wings pale. Discal cell about two and one-half times as long as broad; fork 1 with a pedicel one-half of discal cell, fork 2 black on discal cell less than width, fork 3 back as far as the dot of fork 2, forks 4 and 5 as far back as base of discal cell.

Hind wings with fork 1 plainly shorter than its pedicel, fork 2 back on discal cell more than one-half length of cell. Male genitalia somewhat similar to those of *H. forcipata*, apical parts of superior appendage not curved out, but from side suddenly bend downward, apical part of claspers not as sinuous as in *H. forcipata*, penis with an elongate flap each side of tip similar to that of *H. forcipata*, but not nearly as large, tip with two sharp teeth, a pair of scabrous, elongate processes directed backward.

Forewing, length, male, 11 mm; female, 14.

MINDANAO, Davao Province, Mount Mayo, altitude 4,000 to 5,000 feet, January 26 (*Clagg*). Type, M. C. Z. No. 22066.

Its size and appearance are those of *H. faurei* Navas, of which I have a female from Haight's Place, Mountain Province, Luzon; but the male genitalia (as figured by Navas) are very different; the terminal parts of the females also differ somewhat.

Key to the Philippine species of Hydropsychodes.

1. Wings yellowish, more or less marmorate with brown..... 3.
 Wings black, with white spots or bands..... 2.
2. With four or five narrow white bands on forewings, one of them sub-apical, one basal *albocincta*.
 With several large, mostly costal, and numerous other small pale spots, none in apical area *costalis*.
3. Apical part of clasper widened towards tip, and excised on outer side. *excisa*.
 Apical part of clasper tapering..... 4.
4. Apical part of clasper short, thick at base, pointed at tip..... *masi*.
 Apical part of clasper slender throughout..... *normalis*.

HYDROPSYCHODES NORMALIS sp. nov. Plate 4, fig. 40.

Head and thorax above with pale yellowish gray hair; antennæ pale, annulate with brown; palpi, legs, and spurs pale yellowish. Forewings yellowish, densely speckled and marmorate with brown, often, towards tip especially, quite dark, much darker than in *H. masi*, sometimes as in that species with dark patches near ends of veins; hind wings yellowish gray.

Forewings with discal cell fully two and one-half times as long as broad, fork 1 with pedicel two-thirds of fork, fork 2 only a very short distance back on discal cell, fork 3 hardly reaching the dot of fork 2, forks 4 and 5 start about opposite crossvein from medius to radial sector. In hind wing fork 2 goes back on discal cell about width of latter. Male claspers very slender, the apical part also very slender; superior appendage broad and nearly truncate at tip, with a lobe below each corner; penis slender, enlarged at tip in two lobes with point downward.

Forewing, length, 6 mm.

MINDANAO, Davao Province, Libby, December 9 (*Clagg*); many specimens. Type, M. C. Z. No. 22063.

Readily separated from *H. masi* by the slender apical part of claspers.

HYDROPSYCHODES ALBOCINCTA sp. nov. Plate 4, fig. 43.

Head black, white hair on face, vertex with long, nearly black hair; antennæ pale, annulate with brown; palpi dark brown; thorax dark, with mostly dark hair, some white on pronotum;

legs with dark femora and tibiae, usually pale on base of tibiae, tarsi partly pale, with some dark spaces.

Forewings black, with five white bands, one over the base, a second before end of basal third, forked behind, one over base of discal cell, one from stigmal region not reaching across, and one subapical, slightly curved, and also not reaching across; hind wings wholly dark.

Forewing with discal cell hardly two and one-half times as long as broad, fork 1 with a very short pedicel, fork 2 only a trifle back on discal cell, fork 3 not reaching opposite the dot of fork 2, forks 4 and 5 about opposite middle of discal cell; hind wings with fork 2 back on discal cell not width of latter.

Male genitalia with claspers slender, the apical part especially so, tip sharp and incurved, superior appendage broad, nearly truncate at tip, with a rounded projection at each corner; penis similar to others, with two lobes at tip, more separated than usual.

Forewing, length, 5.5 to 6 mm.

MINDANAO, Davao Province, Lawa, Mount Apo, Galog, Mainit, and Seliban Rivers, September 17 to November 4 (*Clagg*). Type, M. C. Z. No. 22064.

HYDROPSYCHODES MASI Navas.

I have a paratype; it has the apical part of the clasper short and stout at base as figured by Ulmer for *H. marmorata*, based on a female. If Ulmer's identification is correct, *H. marmorata* is the female of *H. masi*.

Key to the Philippine species of *Diplectrona*.

1. With more than one white band on forewing..... 2.
 With but one or no white band on wings..... 4.
2. The two median dark bands with a golden center; third band much wider than second *exquisita*.
 Median dark bands without a golden center; the third, or stigmal, band but little, if at all, wider than second..... 3.
3. Forewing all black, except three white bands, the third entire. *trifasciata*.
 Forewing yellowish except along costa and the apical area, third band broken *tricolor*.
4. Wings wholly dark, no pale band..... 7.
 Wings with pale median band, or almost wholly pale..... 5.
5. Head and thorax dark; wings dark, with a pale median band. *cinctipennis*.
 Head and thorax yellowish, with yellow hair..... 6.

6. Forewing fairly dark, with a distinct median pale band..... *fasciata*.
 Forewing mostly pale yellowish, with a black streak over stigmal area,
 pale band indistinct var. *stigmatica*.
 7. Forewing 8 mm long; male claspers scabrous beneath..... *scabrosa*.
 Forewing 5 mm long; male claspers not scabrous beneath..... *bidens*.

DIPLECTRONA SCABROSA sp. nov. Plate 4, fig. 38.

Head black, front shining, some dark hair below and on vertex; antennæ and palpi black, latter paler near tip; pronotal lobes yellowish and with yellowish hair, rest of thorax black, lobes in front of wings yellowish; legs yellowish, tarsi dark, as also spurs; abdomen brown.

Wings entirely blackish, clothed with short black hair, upper base of median cell and first anal vein towards base very narrowly margined with hyaline, a hyaline dot over end of anal vein; hind wings as dark as the forewings. Hind wing with the venation much like that of *fasciata*, fork 5 widened near base as in that species; forewing with the crossvein back from base of median fork widely disjointed at the cubitus.

Male appendages with basal part of claspers very much roughened below and with stiff hairs, apical portion of clasper very slender and pointed; superior processes with tips sharp and out-curved.

MINDANAO, Mount Apo, Sibulan River, altitude 700 to 800 feet, September 6 (*Clagg*). Type, M. C. Z. No. 22059.

I have a female *Diplectrona* from Mount Maquiling, Luzon, which may be *D. bidens* Ulmer. It is wholly dark and of the right size, the legs yellow brown, tarsi paler. The crossvein back from base of median fork is continuous as usual; fork 5 of hind wing hardly widened near base.

DIPLECTRONA FASCIATA var. **STIGMATICA** var. nov. Plate 5, fig. 48.

Specimens from Mount Apo are larger and very much paler than the typical *fasciata*; wing not darkened except for a prominent long dark streak over stigmal region; white band present, but scarcely noticeable on account of pale yellowish background; yellowish cast on base of forewing of typical *fasciata* here extending out to the white band; hind wing with a slender, curved, dark streak over and behind the union of subcosta and radius. Head and thorax yellowish.

Male genitalia very similar to those of *fasciata*, the superior processes not curving outward as much as in *fasciata*, tip of penis, in side view, showing a slender, curved prong above, which I cannot find in *fasciata*.

Expanse, 18 to 21 mm.

MINDANAO, Davao Province, Mount Apo, Mainit River, altitude 6,000 feet, September 7, 10, 14, and 22, October 21; Galog River, altitude 6,000 feet, October 23, November 4 (*Clagg*): Zamboanga (*Clark*). LUZON, Mountain Province, Baguio (*Baker*). Type, M. C. Z. No. 22061.

DIPLECTRONA TRICOLOR sp. nov. Plate 4, fig. 37.

Face yellowish, front dark, vertex mostly pale and with yellowish hair, palpi brown, antennæ with basal part pale, then gradually marked with brown until almost wholly brown; thorax yellowish, with yellowish hair; legs pale yellowish, front tarsi and spurs darker; abdomen brown above, pale beneath, appendages pale. Forewings with three white bands and a part of a fourth near base, apical band interrupted, upper portion with a projection towards tip of wing where there is a white spot along the margin; veins with black hairs, general surface with appressed yellowish hair, along the costal border and in most of the apical area densely covered with dark brown hair, costal parts shading behind into pale, a pale streak in the interruption of apical band; the three white bands fairly narrow and subequal.

Hind wings pale, with mostly scattered dark hair, the apical part dark brown, here a large white spot opposite the subapical band of forewings. Venation of hind wings very similar to that of *fasciata*, but fork 5 scarcely, if at all, wider near base, and thus not approaching the vein in front as closely as in *fasciata*. Forewings with crossveins extremely faint, that closing the median cell most distinct, that from the base of the median fork back across cubitus not visible; discal cell rather slenderer than in *fasciata*.

Male appendages with apical part of claspers very slender; superior processes with apical point sharp and much outcurved.

Expanse, 20 mm.

MINDANAO, Davao Province, Mount Mayo, altitude 3,000 to 4,000 feet, January 28 (*Clagg*). Type, M. C. Z. No. 22058.

DIPLECTRONA EXQUISITA sp. nov. Plate 4, fig. 35.

Head black, with snow-white hair, palpi dark brown, antennæ with basal joint pale, beyond dark brown for about fifteen joints, beyond white; thorax brown, pronotum with white hair; legs brown, tips of front femora pale, front and midtibiæ with appressed white hair on outer side, mid- and hind tarsi white on basal half, upper spurs partly white, apical spurs brown; abdomen dark brown.

Forewings with three white bands, between them, and towards base, and the apical part brown; the two submedian brown bands contain a band of golden hair; first white band much wider behind than in front, second white band narrower than first, a little wider in front than behind, third white band about twice as broad as second, narrowly interrupted in middle by brown along a vein, behind not quite reaching hind margin; near tip of wing three small white spots between veins, and trace of a fourth. Hind wings fumose, brown in apical and costal parts, here a large white spot opposite the third white band of forewing, a white costal streak opposite the middle white band of forewing.

Hind wings with venation similar to that of *fasciata*, but fork 5 is not widened near base. Forewings also with venation similar to that of *fasciata*, all the forks rather more elongate than in that species. Male appendages with claspers much as in *fasciata*, the apical part with blunt tip, the basal part with tawny hair below; superior processes with a slender, sharp, out-turned tip.

Expanse, 14 mm.

LUZON, Laguna Province, Mount Maquiling (*Baker*). Type, M. C. Z. No. 22060.

TINODES TAGALICA sp. nov. Plate 3, fig. 30.

Black; head with some white hair in front and between the antennæ, darker hair on vertex; palpi dark, especially the large joints; antennæ brown, narrowly annulate with pale at tips of joints; legs dark; in male the base of midtibia and the whole of midtarsus white, spurs dark; wings dark, with black hair.

Forewings with discal cell scarcely twice as long as broad at tip, fork 2 back a trifle on the discal cell, fork 3 about two-thirds as long as fork 2, fork 4 about equal in length (but base before) to fork 3, fork 5 reaching back to before base of discal cell. In hind wings fork 2 back to the crossvein to medius, fork 3 with a short pedicel.

Male genitalia with a broad superior basal piece, beneath it a slender, reddish, down-curved piece with a tiny process at tip, on each side the very slender lateral appendages, very hairy, and below a pair of rather heavy elongate pieces with a small projection at lower tip. Female ovipositor upcurved, nearly one-half the length of abdomen.

Forewing, length, 4.5 mm.

MINDANAO, Davao Province, Mount Mayo, altitude 4,000 to 5,000 feet, January 27; Mount Apo, Mainit River, altitude 6,000 feet, September 14; Sibulan River, altitude 2,000 feet, November 13; and Baroring River, altitude 7,000 feet, November 9 (*Clagg*). Type, M. C. Z. No. 22067.

TINODES ADJUNCTA sp. nov. Plate 3, fig. 32.

Head brownish, with yellowish to dark hair; antennæ brownish, annulate with pale; palpi brown; thorax pale in middle, brown on sides; legs pale, spurs brown, tarsi brownish.

Forewings dark, clothed with short golden and black hairs; hind wings gray, with scattered black hairs. In forewings discal cell a little more than twice as long as broad, fork 2 back about one-half cell width on discal, fork 3 a little longer than its pedicel, fork 4 hardly as long as fork 3, fork 5 plainly a little longer than fork 4.

Hind wings with fork 2 back to crossvein, fork 3 back a little before crossvein, fork 5 large and wide. Male genitalia with a broad basal piece above, with a median process, a pair of slender lateral bristly appendages, a broad lower plate, and a broad median reddish piece, down-curved, with a pair of spines before tip and below a pair of recurved spines.

Forewing, length, 5 mm.

MINDANAO, Davao Province, Mount Apo, Galog River, altitude 6,000 feet, and Todaya Plateau, altitude 5,000 feet, October 2 (*Clagg*). Type, M. C. Z. No. 22068.

POLYPLECTROPUS GRANDIS sp. nov. Plate 4, fig. 36.

Head clothed with golden hair, some more tawny hair near posterior middle of vertex; pronotum also with tawny hair, also on the sides of mesonotum, but that on middle of mesonotum pale yellowish; antennæ yellowish, each joint rather broadly marked with brown; palpi yellowish, basal joints more brown; legs dull yellowish, femora more brownish, spurs tawny.

Forewing rich brown, quite densely marked with square to rounded pale yellow spots, most of them between the veins, nearly all of them small, but a much larger one near middle of posterior margin; no spots in basal part of fork 2 or in adjoining areas; a few of the spots tend to form bands, but most of them do not; hind wings dark, with blackish hair.

Forewings with fork 1 about as long as its pedicel, fork 2 starting at end of discal cell, fork 3 two-thirds as long as fork

2, fork 4 reaching back a little before median crossvein, fork 5 reaching nearly to base of median cell.

Male genitalia appressed to tip of abdomen so as to be inconspicuous; two long spines subparallel seen from behind, bending downwards, each arising from an elongate plate, the lower part of which is scabrous; ventral pieces jet black and with a spinelike process directed backward from near their tips, seen from above these pieces are very broad and nearly truncate.

Forewing, length, 10 mm.

MINDANAO, Davao Province, Mount Apo, Galog River, altitude 8,000 feet, October 18 (*Clagg*). Type, M. C. Z. No. 22069.

POLYPLECTROPUS ULMERI sp. nov. Plate 3, fig. 28.

Head and thorax densely clothed with yellowish hair; antennæ, palpi, and legs yellowish. Forewings brown, with many small, narrow, transverse patches of yellow hair, most numerous beyond the middle and tending to form transverse bands; fringe almost wholly brown; hind wings with blackish hair and fringes.

Venation similar to that of other species; fork 1 shorter than its pedicel, fork 2 starting from the discal cell, fork 3 hardly more than one-half of fork 2, fork 4 scarcely longer than 3, fork 5 very long.

Male genitalia remarkable in having the spinelike processes extremely long and slender, wholly down-curved, and subparallel to each other (much longer than in other species); median superior appendage a rather slender spinelike process deeply forked at tip; ventral pieces extremely hairy, rather long and heavy, and separated by their width.

Forewing, length, 5 mm.

LUZON, Laguna Province, Los Baños (*Baker*). Type, M. C. Z. No. 22070.

Genus *DOLOCLANES* novum

A philopotamine; ocelli present; posterior warts large; spurs, 2, 4, 4; midtibia of female not dilated; palpi with first three joints large, fourth rather more slender, last as long as third and fourth together, much more slender, slightly curved, the apical part appearing as a separate segment.

Discal cell very short, closed (though faintly) in both wings, in forewings above with an oblique crossvein towards radius but not reaching that vein; in forewing forks 1 to 5 present, in hind wings forks 1, 2, 3, and 5, fork 5 in both wings very large and long; in forewings forks 1 and 2 reaching discal cell,

in hind wings fork 2 reaching discal cell, fork 1 very short, its upper edge running into radius near end of radius.

Type of the genus, *Doloclanes montana* sp. nov.

Distinct by the very short discal cell with extremely long pedicel, the incomplete crossvein above discal cell, and by the first apical vein of hind wing running into radius.

DOLOCLANES ALTICOLA sp. nov. Plate 3, figs. 25, 27, and 29.

Head dark, clothed with mostly dark hair; palpi brown; antennæ brown, barely annulate with pale; thorax dark, with mostly dark hair, some paler on sides; legs brown, especially front legs and spurs, hind legs more yellowish brown, tibia with long hair. Wings dark, with dark hair, apical fringe black, a hyaline spot over end of discal cell and behind it.

Forewings with discal cell hardly twice as long as broad, fork 1 back on discal cell two-thirds of cell, fork 2 scarcely back on discal cell, fork 3 fully two-thirds of fork 2, but much longer than pedicel, fork 4 fully as long as fork 3, fork 5 extremely long, almost back to forking of medius.

Hind wings with fork 1 shorter than pedicel, its upper vein running into radius fully width of cell before end, fork 2 back to discal cell, very slender, fork 3 hardly more than one-half of fork 2, fork 5 very long.

Male genitalia with two slender pieces above, the lower pieces 2-jointed, basal joint broad and heavy, apical about as long, slender (except base), and with a down-curved tip, between them the intermediate piece, which has a blunt tip and extends scarcely beyond the basal part of lower appendage.

Forewing, length, 4 to 4.3 mm.

MINDANAO, Davao Province, Mount Apo, Galog River, altitude 6,000 feet, October 19; and Mainit River, altitude 6,500 feet, October 22 (*Clagg*). Type, M. C. Z. No. 22072.

DOLOCLANES MONTANA sp. nov. Plate 3, fig. 26.

Head yellowish brown, with mostly pale hair, some hairs on each side of vertex dark; palpi pale brown; antennæ pale; thorax with mostly pale hair, some on outer sides of pronotum dark; legs pale, hind tibiæ very hairy. Wings dark, clothed with short black hair and fringes; a faint hyaline mark at end of discal cell and over crossvein behind to medius.

Forewings with discal cell about twice as long as broad, with an extremely long pedicel; fork 1 going back on discal cell less than one-half width of cell, fork 2 back a trifle on discal cell,

fork 3 only about one-half as long as fork 2, hardly as long as its pedicel, fork 4 slightly longer than 3, fork 5 reaching back almost to forking of medius.

Hind wings with discal cell also very short, fork 1 short, its upper edge running into the radius as the latter ends, fork 2 back to discal cell, fork 3 not one-half length of 2, pedicel much longer than fork, fork 5 large and long.

Male genitalia with a pair of parallel, subclavate, superior appendages, below a pair of longer, 2-jointed appendages, basal part heavy and broad at base, apical part about two-thirds of basal and more slender, within is a median piece with a slender, upcurved, spinelike tip.

Forewing, length, 5 mm.

MINDANAO, Davao Province, Mount Mayo, altitude 4,000 to 5,000 feet, January 27 (*Clagg*). Type, M. C. Z. No. 22071.

ECNOMUS RIZALI sp. nov. Plate 5, fig. 54; Plate 6, fig. 63.

Head dark, with mostly dark hair, some yellowish between antennæ; antennæ dark, annulate with pale; palpi dark, thorax with yellowish hair through middle, dark on sides; legs yellowish to yellow-brown, tarsi dark, annulate with pale.

Forewings brown, with many, small, scattered patches of golden hair, the larger ones at intervals near hind margin; hind wings gray, with black hair and fringes. Forewings with discal cell a little more than twice as long as broad, fork 1 about as long as its pedicel, longer than fork at end of radius, fork 2 back a trifle on discal cell, fork 3 about twice as long as its pedicel, fork 4 back a trifle on crossvein, fork 5 not as long as fork 4.

Hind wings with fork 2 plainly longer than its pedicel, fork 5 shorter than 2.

Male genitalia from above show two long, slender, slightly curved processes, with the lower appendages heavy and their tips recurved within, from the side the lower appendages have a long basal part, and a slenderer, upcurved, apical part.

Forewing, length, 5 mm.

MINDANAO, Davao Province, Mount Mayo, altitude 4,000 to 5,000 feet, January 27 and 28 (*Clagg*). Type, M. C. Z. No. 22073.

Key to the Philippine species of Chimarra.

1. Radial sector just before discal cell not bent, discal cell triangular, no bare space before it *recta*.
- Radial sector just before discal cell plainly bent, and a smooth space behind and sometimes above it 2.

2. Length of forewings less than 4 mm..... 3.
 Length of forewings plainly more than 4 mm..... 4.
 3. Crossvein at end of discal cell and one behind it white; antennæ and palpi fulvous *leucophlebia*.
 Crossvein not white; antennæ and palpi brown..... *alticola*.
 4. Discal cell triangular, base almost pointed; forewings about 6 mm long. *tagalica*.
 Discal cell almost quadrangular, much widened near base; forewings about 5 mm long..... *luzonica*.

CHIMARRHA TAGALICA sp. nov. Plate 5, fig. 53.

Head and thorax yellowish, clothed with pale golden hair; palpi (except pale base) brown; antennæ pale, very narrowly annulate with dark and becoming brownish towards tip; legs pale dull yellowish, front tibiæ and tarsi brown; spurs brown.

Forewings clothed with short yellowish and black hairs producing a uniform dull yellowish color, a large bare space just beyond the forking of radius, fringe dark brown on costa, more gray along hind margin; hind wings gray.

Forewings with radial sector from base to discal cell strongly bent to form the bare cell, and also a smaller, slightly swollen, bare space behind radial sector just before discal cell; discal cell triangular, tip slightly oblique. Forks 1 and 2 sessile on discal cell, fork 3 subequal to its pedicel, fork 5 back as far as base of discal cell. Male genitalia showing two long, straight, hairy, pale inferior appendages, a dark brown, somewhat clavate, lateral appendage, and between these two membranous processes, each tipped by a long, straight black spine.

Forewing, length, 6 mm.

MINDANAO, Davao Province, Mount Apo, Galog River, altitude 6,000 feet, October, 19; Mount Mayo, altitude 4,000 to 5,000 feet, January 26 (*Clagg*). Type, M. C. Z. No. 22075.

CHIMARRHA ALTICOLA sp. nov. Plate 5, fig. 55.

In size, in the shape of discal cell, and the bent radial sector before it, and the short fork 3 this species agrees closely with the figure of *C. leucophlebia* Navas from northern Palawan. The median cell, however, is more elongate, and all apical cells are very much longer, so the discal cell is about twice its length from the tip of wing.

Head dark, hair pale yellowish, but a dark tuft on vertex each side by the eyes; palpi and antennæ dark brown (fulvous in *leucophlebia*); yellowish or fulvous hair on thorax as well as some dark hair.

Wings dark, clothed with black hair, in certain lights showing scattered golden hairs, end of discal cell no paler than other

veins (white in *leucophlebia*); fork 1 extends back a little on discal cell, but fork 2 does not, fork 3 much shorter than its pedicel. Hind wings with fork 1 going back a little on discal cell, the latter only about one-half as long as in forewing, fork 3 very short.

Legs pale yellowish, hind tibia and tarsi darker, spurs brown.

Male genitalia with a pair of heavy lower appendages, somewhat bent, tip oblique and faintly concave, tipped with a tapering incurved piece.

MINDANAO, Mount Apo, Sibulan River, altitude 7,000 to 8,000 feet, September 6, Galog River, altitude 6,000 feet, November 4; Mount Mayo, altitude 4,000 to 5,000 feet, January 26 (*Clagg*). Type, M. C. Z. No. 22074.

ILLUSTRATIONS

PLATE 1

- FIG. 1. *Ophiodopelma multipunctata* Hagen; forewing.
 2. *Cæcilius nitoris* sp. nov.; forewing.
 3. *Seopsis tricolor* sp. nov.; forewing.
 4. *Cæcilius claggi* sp. nov.; forewing.
 5. *Seopsis luzonica* sp. nov.; fore and hind wings.
 6. *Microsocus basalis* sp. nov.; forewing.
 7. *Cæcilius otiosus* sp. nov.; forewing.
 8. *Psocus alticolus* sp. nov.; forewing.
 9. *Psocus incomptus* sp. nov.; head from above, and in front.
 10. *Epipsocus prominens* sp. nov.; forewing.
 11. *Chrysopa mindanensis* sp. nov.; venation near divisory cell.

PLATE 2

- FIG. 12. *Psocus dolorosus* sp. nov.; forewing.
 13. *Hemerobius rizali* Banks; genitalia, side.
 14. *Spiloconis interrupta* sp. nov.; forewing.
 15. *Parasemidalis tagalica* sp. nov.; forewing.
 16. *Chrysopa derota* sp. nov.; venation near divisory cell.
 17. *Epipsocus prominens* sp. nov.; forewing.
 18. *Cæcilius conspicuus* sp. nov.; forewing and head.
 19. *Pseudocæcilius innotatus* sp. nov.; forewing.
 20. *Neoperla bakeri* Banks; genital process.
 21. *Neoperla claggi* sp. nov.; genital process.
 22. *Chrysopa apoana* sp. nov.; venation near divisory cell.
 23. *Chrysopa apoana* sp. nov.; veins between radius and radial sector.
 24. *Hemerobius vagans* sp. nov.; male genitalia, side.

PLATE 3

- FIG. 25. *Doloclanes alticola* sp. nov.; forewing.
 26. *Doloclanes montana* sp. nov.; part of forewing, genitalia, side.
 27. *Doloclanes alticola* sp. nov.; genitalia, side and above.
 28. *Polyplectropus ulmeri* sp. nov.; genitalia, side, below, penis.
 29. *Doloclanes alticola* sp. nov.; hind wing and palpus.
 30. *Tinodes tagalica* sp. nov.; genitalia, side and above.
 31. *Hydropsyche forcipata* Ulmer; penis, and superior median piece.
 32. *Tinodes adjuncta* sp. nov.; genitalia, below, side, and median piece.
 33. *Neoperla obliqua* sp. nov.; genital process and area.
 34. *Neoperla recta* sp. nov.; genital process and area.

PLATE 4

- FIG. 35. *Diplectrona exquisita* sp. nov.; forewing, genitalia above, clasper, and penis.
36. *Polyplectropus grandis* sp. nov.; genitalia below, and side.
37. *Diplectrona tricolor* sp. nov.; forewing, part of hind wing, genitalia above, and clasper.
38. *Diplectrona scabrosa* sp. nov.; genitalia above, clasper.
39. *Hydropsyche rizali* sp. nov.; genitalia, above.
40. *Hydropsychodes normalis* sp. nov.; genitalia, above.
41. *Hydropsyche rizali* sp. nov.; genitalia, side.
42. *Hydropsychodes normalis* sp. nov.; genitalia, side.
43. *Hydropsychodes albocincta* sp. nov.; forewing.

PLATE 5

- FIG. 44. *Gera disparilis* sp. nov.; genitalia, above, below, clasper.
45. *Gærinella bicolor* sp. nov.; forewing.
46. *Anisocentropus nitidus* sp. nov.; palpus.
47. *Diplectrona fasciata* Ulmer; lower piece from side.
48. *Diplectrona fasciata* var. *stigmatica* var. nov.; lower piece from side, genitalia from above.
49. *Gærinella apoana* sp. nov.; genitalia, above.
50. *Anisocentropus nitidus* sp. nov.; genitalia, side.
51. *Gærinella apoana* sp. nov.; forewings of male and of female.
52. *Anisocentropus nitidus* sp. nov.; forewing.
53. *Chimarrha tagalica* sp. nov.; genitalia, side, and forewing in part.
54. *Ecnomus rizali* sp. nov.; genitalia, above.
55. *Chimarrha alticola* sp. nov.; genitalia, below, and side.

PLATE 6

- FIG. 56. *Æcetis claggi* sp. nov.; forewing, genitalia, side.
57. *Æcetis separata* sp. nov.; genitalia, side, and forewing.
58. *Æcetis pilosa* sp. nov.; forewing, genitalia, side, and clasper, below.
59. *Æcetis separata* sp. nov.; genitalia, above.
60. *Setodes flavipennis* sp. nov.; genitalia side, penis above.
61. *Allosetodes assimilis* sp. nov.; forewing.
62. *Setodes flavipennis* sp. nov.; superior appendages from above.
63. *Ecnomus rizali* sp. nov.; genitalia, side.
64. *Allosetodes assimilis* sp. nov.; genitalia, side.

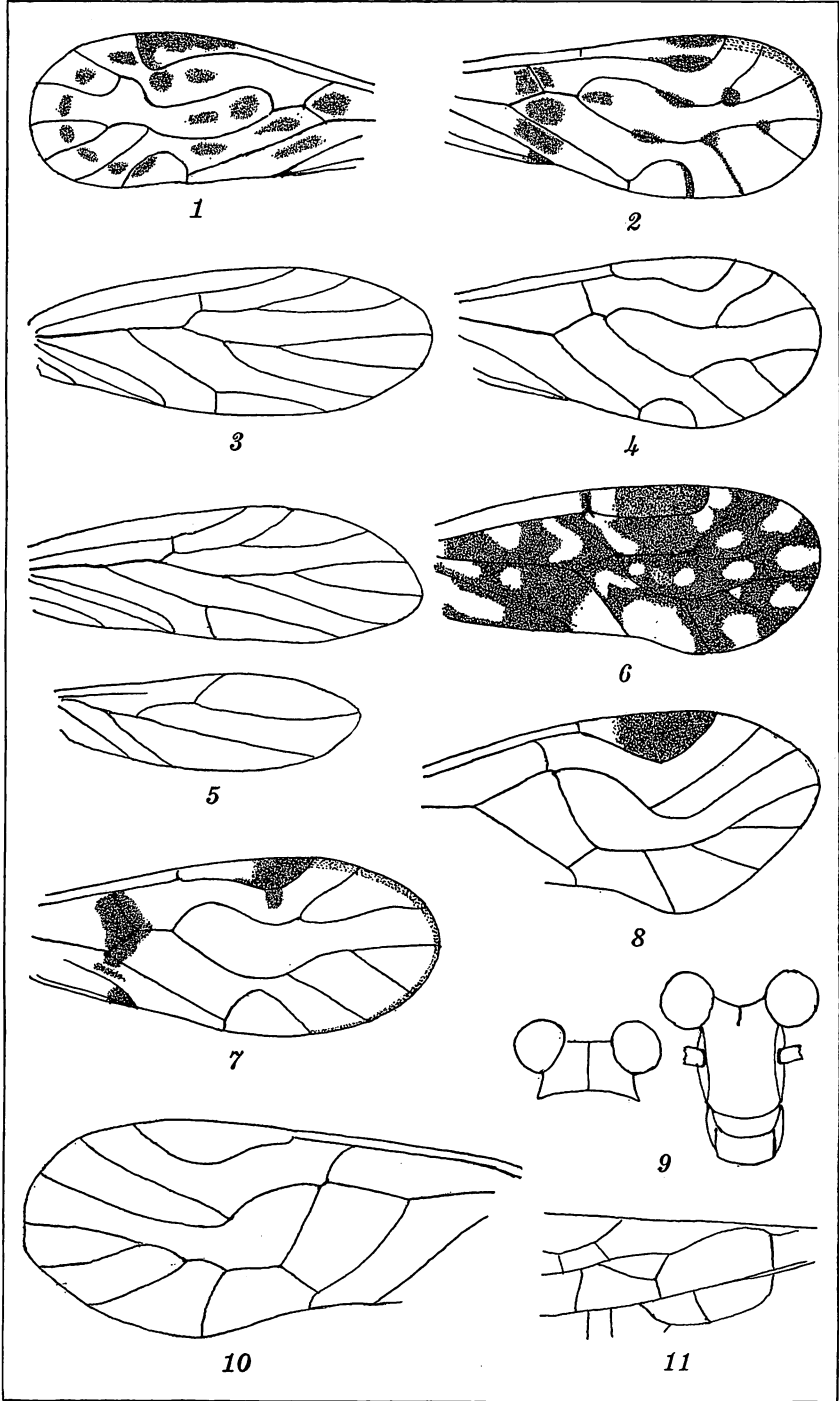


PLATE 1.

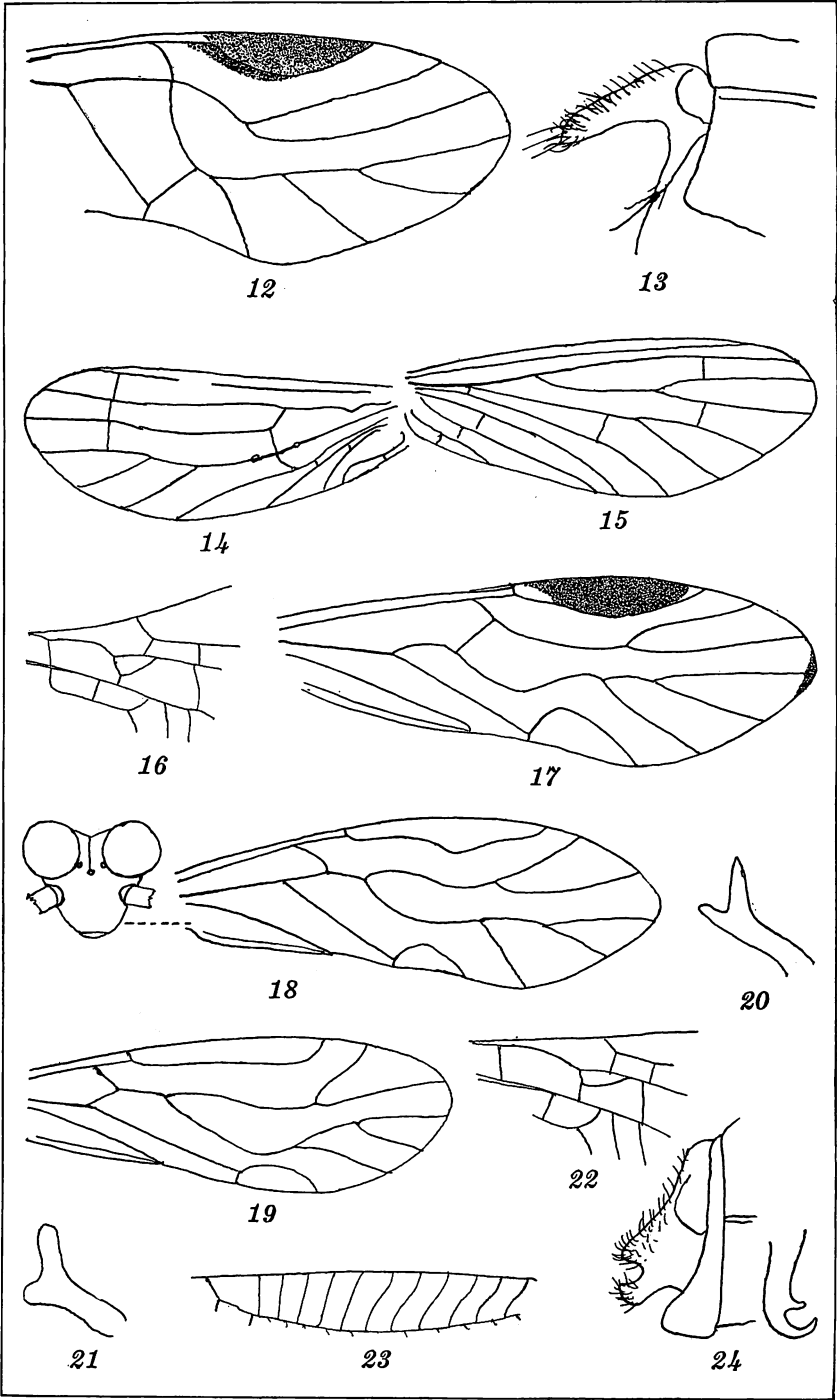


PLATE 2.

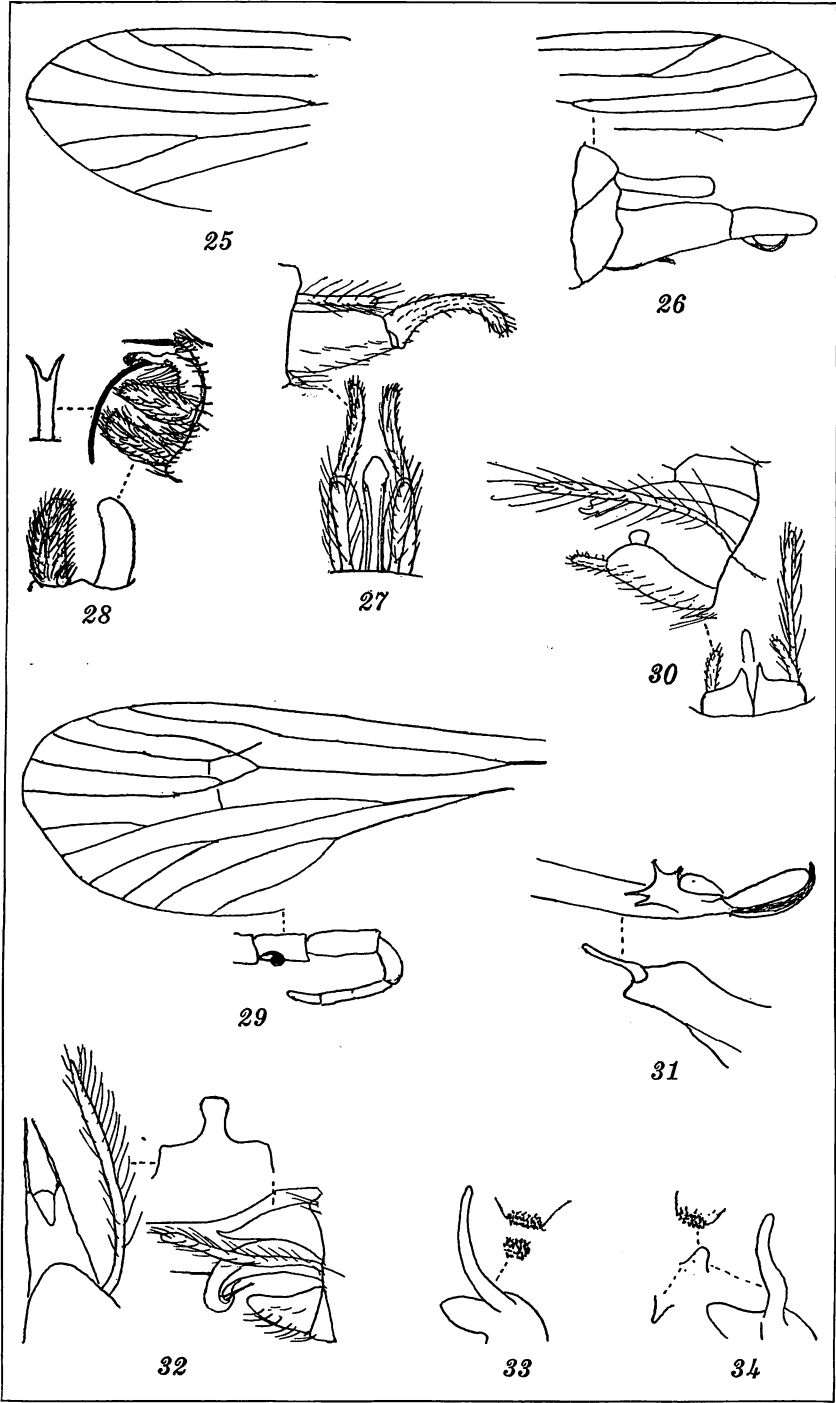


PLATE 3.

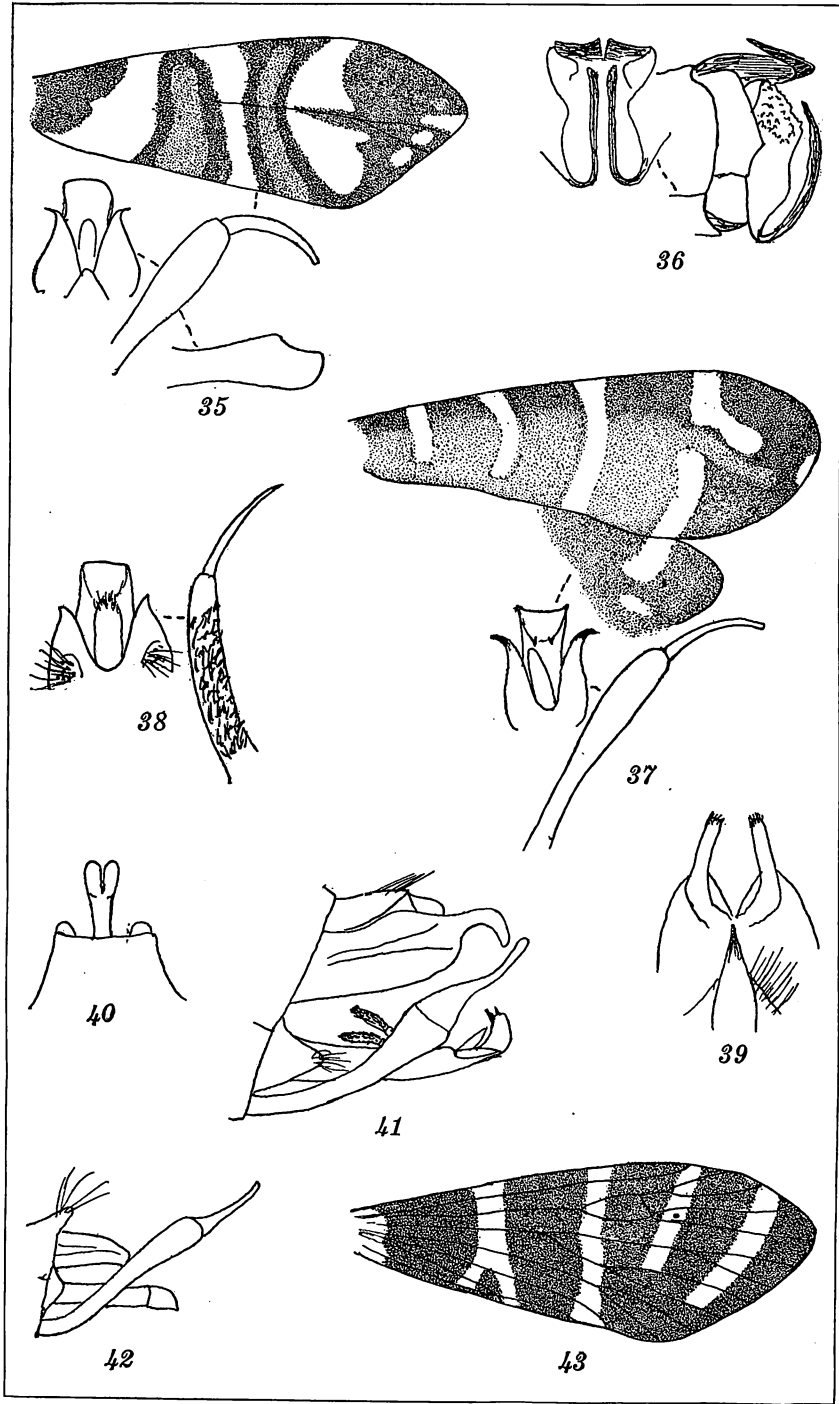


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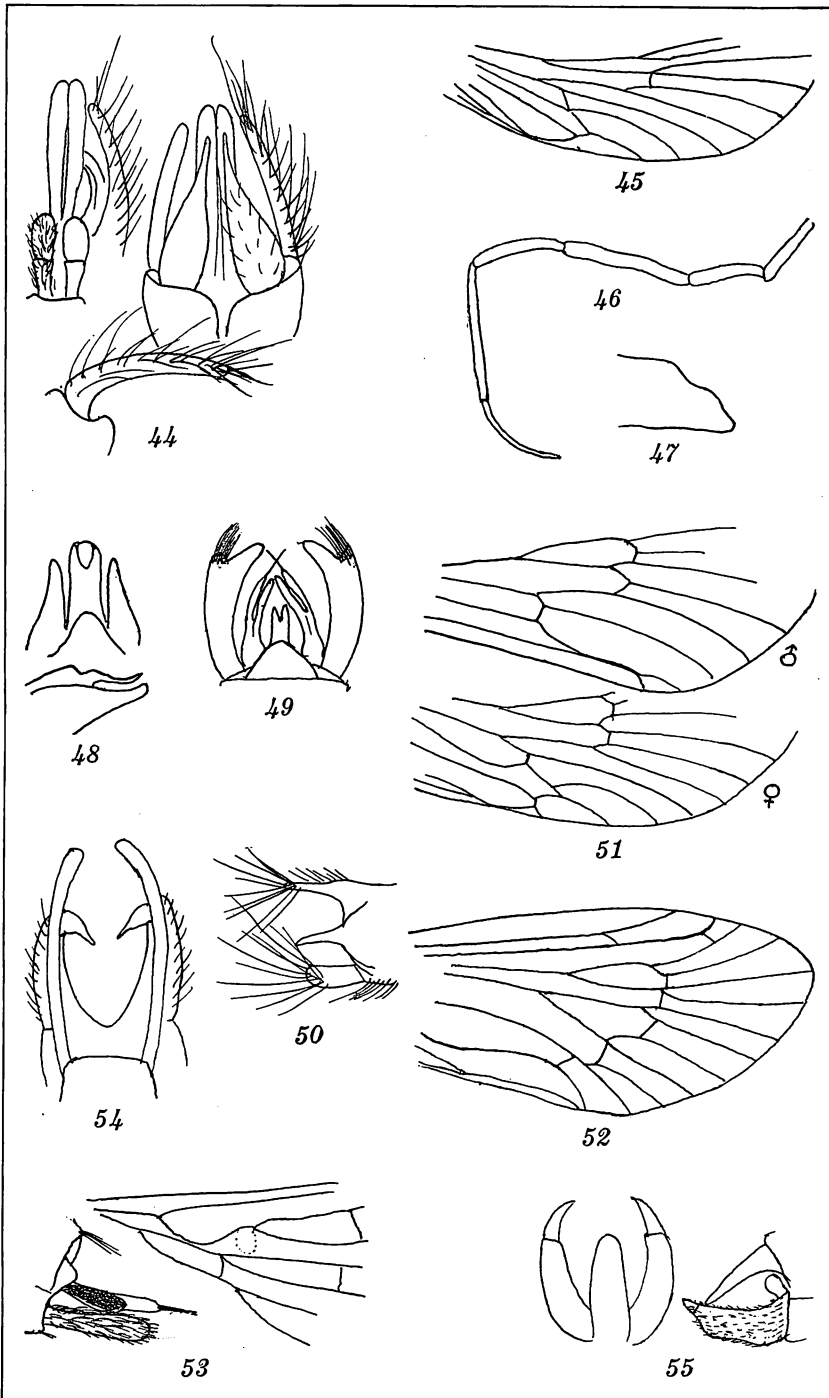


PLATE 5.

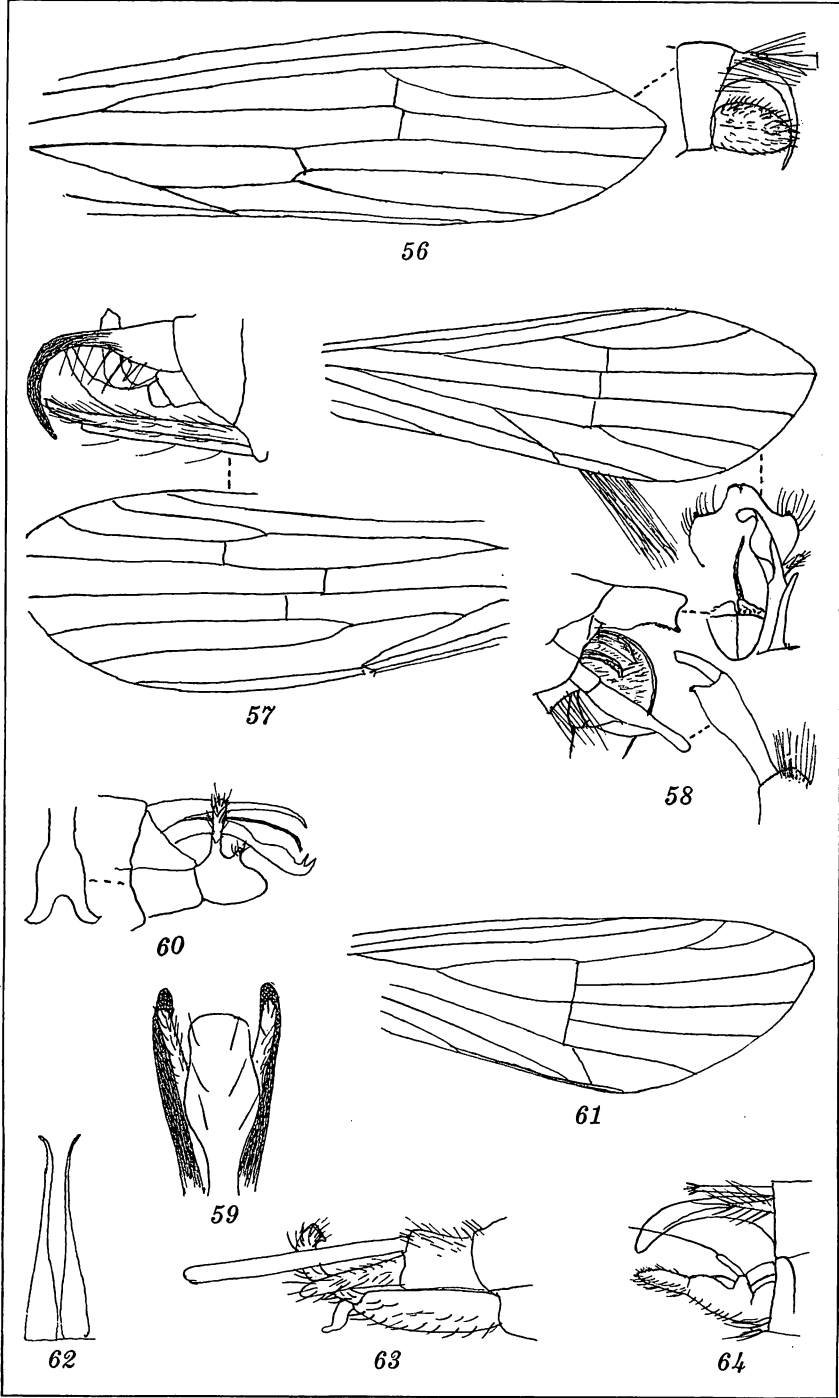


PLATE 6.